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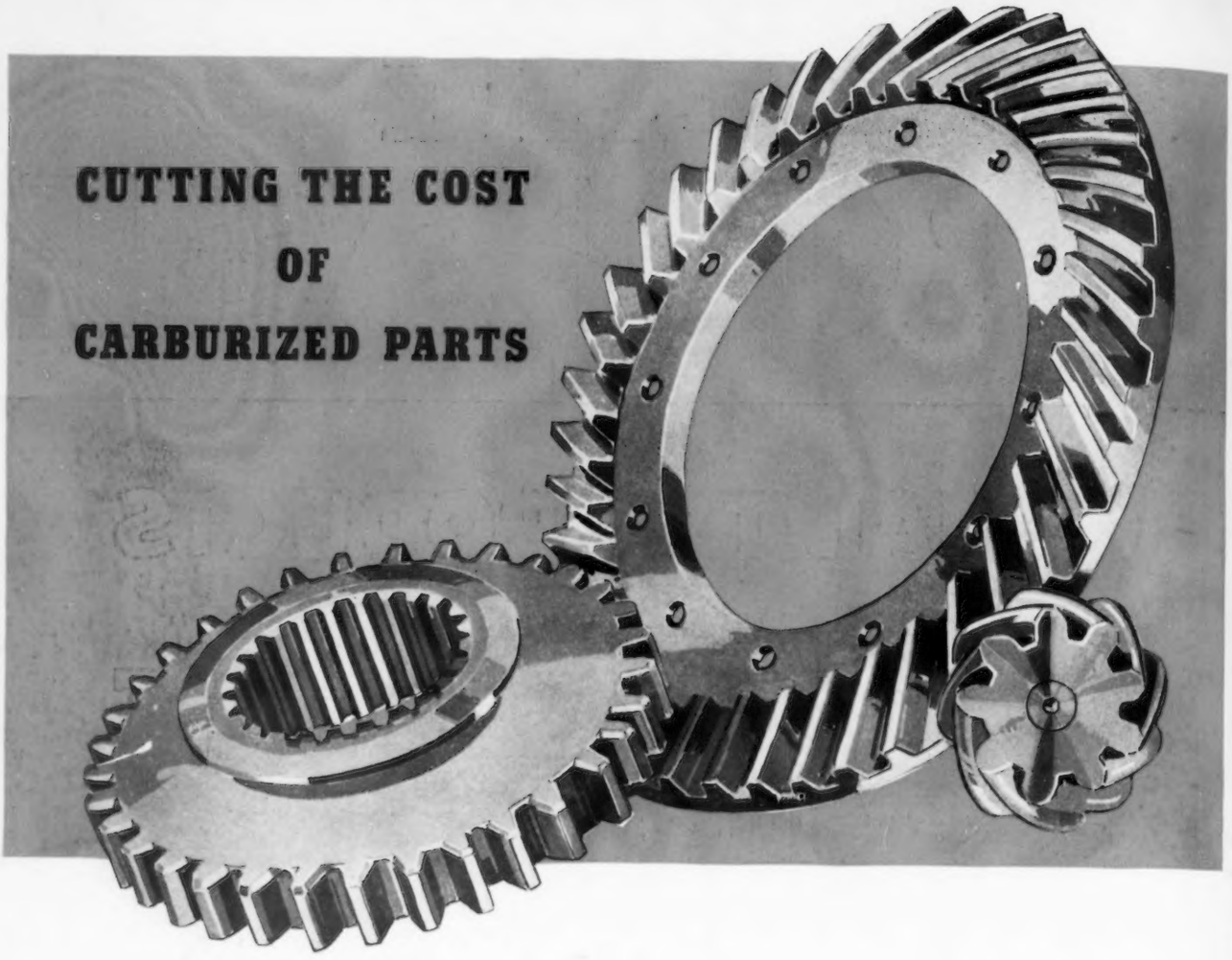

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... THE IRON AGE ...

MARCH 19, 1936

ESTABLISHED 1855

Vol. 136, No. 12

The Great Un-American Wire Tapping Plot

THE Spanish Inquisition may be condoned upon the grounds of prevailing intolerance. The Russian OGPU may be justified by the fact that it is a part of a state absolutism which frankly prohibits contrary political opinion.

In the United States, however, which still professes freedom of speech and opinion, no excuse can exculpate the Black Committee for the campaign of terroristic wire-tapping that it has perpetrated against political opponents of the Administration.

To escape a singeing from his own frying pan, Senator Black paints his activities as perfectly legal, declaring that proper subpoenas were issued for the messages seized. This reminds us of the quaint excuse of the cattle rustler who said that his actions were beyond criticism because all of the cattle in his possession at the time of his arrest carried his own brand.

The issuing of subpoenas **after** the act of illegal seizure does not absolve from crime any more than does rebranding a stolen steer.

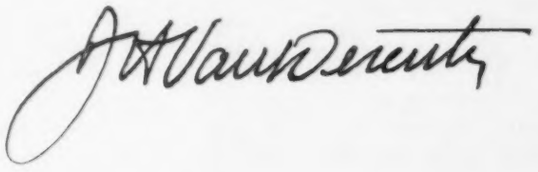
It has now been disclosed that the Federal Communications Commission, a Government body which holds "life and death" power over the Federally licensed commercial communications services, did the preliminary snooping for the Black committee.

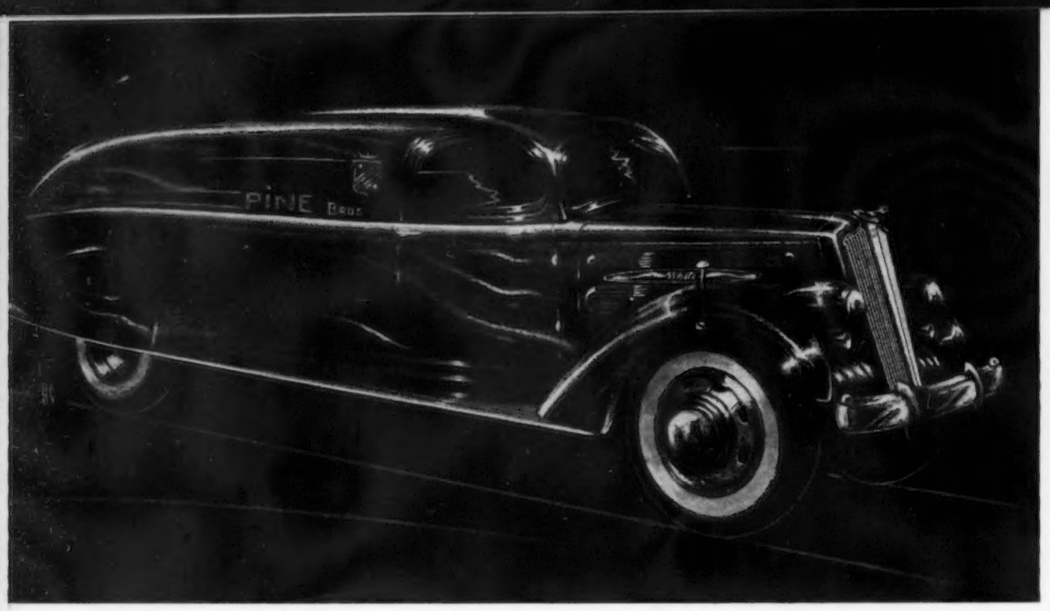
Through pressure brought to bear upon Western Union, Postal Telegraph and RCA, employees of this commission "rifled" the files of these companies, making thousands of copies of confidential messages and without the formality of search warrant or subpoena. Singularly enough, these wholly unconstitutional seizures of private property were confined to messages sent or received by known opponents of the New Deal.

After the Federal Communications Commission had thus acted as cat's-paw for the Black committee, it was easy for the latter to rebrand the stolen steers by issuing detailed subpoenas.

The companies involved in this matter, whose good will and future business depend upon the confidence of customers who intrust their private messages to them, should certainly welcome an opportunity to put the blame where it belongs.

And the public should welcome an opportunity to discover the ominous threat to liberty involved in the Federal licensing of any business.





COMMERCIAL transportation is becoming style conscious too. One might well feel complimented by having this streamlined White pull up at his delivery door.

Elastic Assembly Line Features

SOME time ago the White Motor Co. developed a very unique production system for its chassis assembly lines to permit the assembling of different models on the line at the same time. Truck models are numerous and there might be a dozen different models on the line at the same time, each requiring a different amount of work in assemblying.

Under the system that was adopted the chassis are spaced on the line at varying distances, which are predetermined by the amount of work required in assembling

ONE of the difficult problems that confront manufacturers of motor trucks is to devise means for the progressive assembly of chassis that will make practical the assembly of different models of chassis on the same assembly line at the same time, secure the maximum of proficiency and speed of assembly and keep a steady flow of trucks in process of assembly. Furthermore to keep the men working on the assembly line constantly employed so that there will be no curtailment of their earnings, and to avoid increases in the various costs of assembly of the models, regardless of whether or not the consecutive assemblies are of one or several different models.

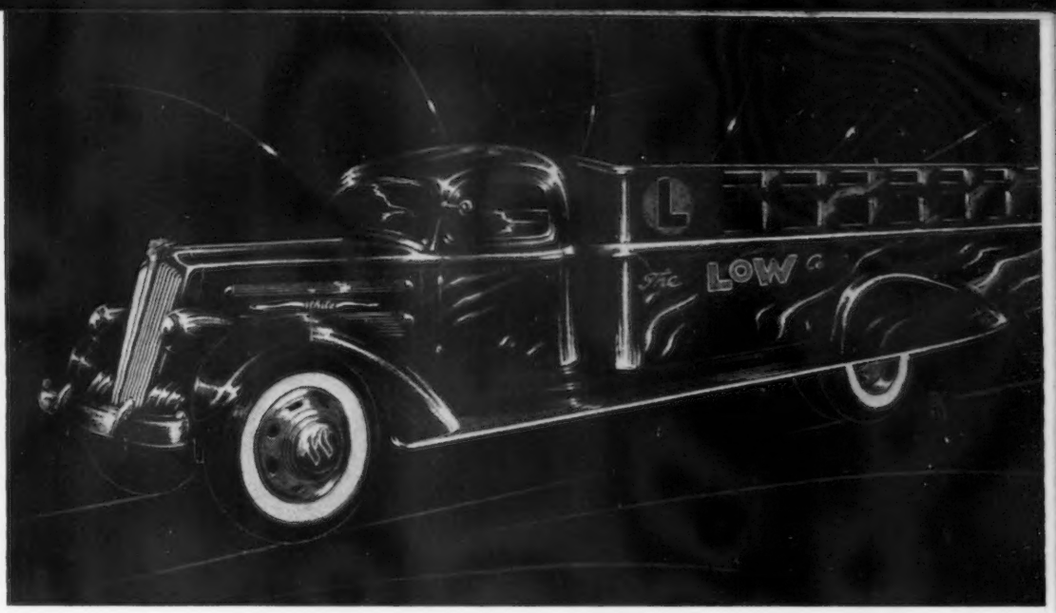
Production set-ups, conveyor speeds and other factors are comparatively simple to work out for a chassis assembly line in an automobile plant turning out hundreds of one or very similar models of a passenger car or chassis in a day. However conditions are entirely different in a motor truck plant where there are innumerable models, several of which may be on the same assembly line at the same time. Process time is an important factor inasmuch as the majority of trucks are assembled to fill customers' orders, instead of for stock. A truck, being a piece of equipment purchased to produce profit for the user, must be built to suit specific requirements. These requirements vary so greatly that a "general use" truck cannot be built which will fit all needs of all truck users economically.

The White Motor Co., Cleveland, manufacturer of quality trucks and buses, has developed production methods for its assembly lines which have overcome the difficulties expressed in the preceding paragraph. Experience has shown that not only has the company been able to assemble varying models consecutively on the same lines, but predetermined process time is established, costs do not vary, number of men employed is reasonably constant, men's earnings do not fluctuate excessively, quality is maintained, inspection simplified, supervision costs are at a minimum and material control rhythmic.

This system is being used on three chassis assembly lines, the successful operation of which required the development of a relatively simple and unique method of scheduling to assembly time, conveyor speeds and spacing of chassis on a conveyor; these three elements depending upon value of total output required and cost of assembly which in turn determines the number of men required on the line.

Whatever models are being assembled, the chassis spaced on the conveyors at predetermined distances apart, move along the conveyor at a speed which keeps all of the men on the line efficiently occupied at all times. Idle time is elimi-

HITHERTO the stake truck has been useful, modest, but not very beautiful. The one at the right has obviously been to a "beauty parlor" with fine results.



White Truck Production

By FRED L. PRENTISS
Cleveland Editor, The Iron Age

each model, as is indicated by the established labor cost for that particular unit. Under the system a correctly determined quota of work is allotted for each man, eliminating idle time and assuring that each man will be kept busy every minute and thus earn his piece rate wages.

Under the operation of the system, no changes whatever are required in the set-up. Should it be desired to increase or decrease production on the line, this is done simply by changing the conveyor speed and the number of men on the line.

nated regardless of the size or assembly cost of the chassis. That the system is simple, flexible and practical has been proven by its successful operation for more than a year.

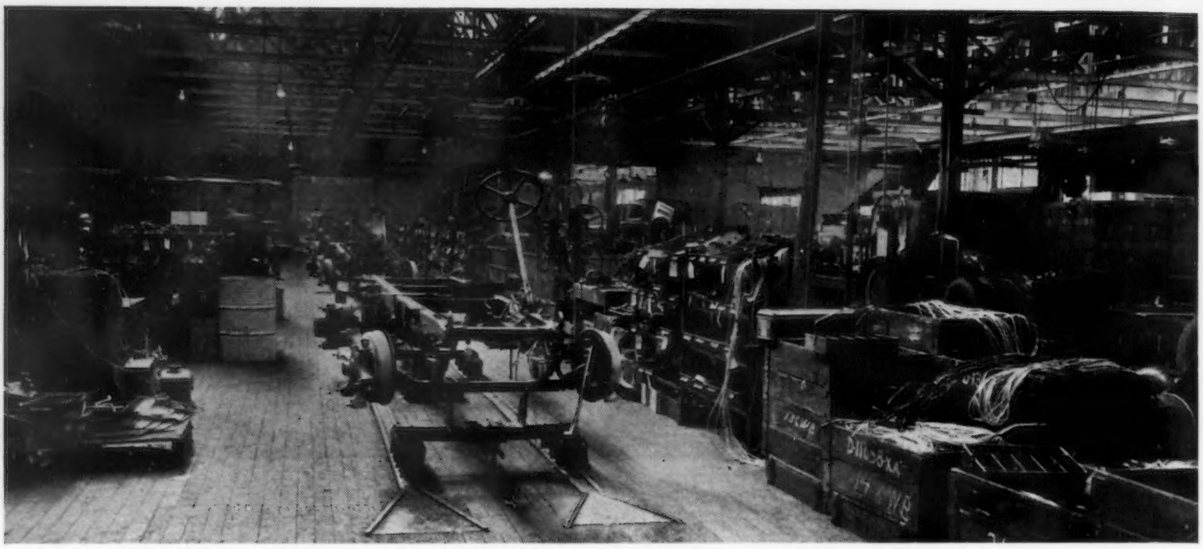
In this chassis assembly layout not only can chassis of considerable variation in size or model be assembled on the same conveyor, but the process time of assembly may be varied as desired without throwing the production schedule out of balance. This is done simply by changing the speed of the conveyor, which is a variable quantity and which always depends on the number of men employed. If a slowing down in production is desirable, this is effected by reducing the number of men on the line even fractions so as to more easily redistribute the work; and by a proportionate reduction in the speed of the conveyor chain. Complete planning for changes in schedules involving increasing or decreasing the number of men on the line is accomplished in a very short time.

The outstanding accomplishment of this progressive assembly set-up is that it allots a correctly determined quota of work to each man. This allotment of work is determined by time study and insures that each man is assigned 60 minutes of work for each hour, and no less; also that no man is expected to do more than 60 minutes' work in each hour.

The particular assembly line which will be discussed is 640 ft. long and consists of two power-driven conveyor chains moving in opposite directions. Two conveyor chains for this line were provided for the reason that the building is not long enough to have a single chain of sufficient length for this assembly unit. A transfer is therefore made from one chain to another of partially assembled chassis. This particular assembly line, designated as the light line, is used for the assembly of chassis for small trucks up to 2½ tons capacity. There is also another line for heavy duty trucks and buses and a third line for assembling street car type motor coaches.

Chassis for eight or more basic models are assembled along the light line. However, the possible variations from these eight basic models number into the hundreds. Ordinarily about 60 chassis are assembled on this line in a 7½ hr. day.

The production control department sees to it that sub-assemblies and parts are supplied along the line at the points of assembly. Some large sub-assemblies such as axles, transmissions and engines are assembled in the basement and carried up by power hoists through openings in the floor to the assembly floor adjacent to the point at which they are to be assembled to the chassis. Other parts are delivered as needed to synchronize with production schedules. Small



START of the assembly line is shown in the foreground. The line consists of two parallel conveyor units moving in opposite direction, partially assembled chassis being transferred at the lower end of the line shown in the foreground to the second line, rather indistinctly shown at the right. The truck is completely assembled on leaving the latter line. An aisle extends between the two assembly lines and small parts are stacked along this aisle and at the sides of the line at points where needed. An overhead hoist brings motors and axles to the line from the basement in guard-enclosed openings in the floor at the side of the line.

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parts are taken to points where they are wanted in tote boxes that are kept filled by stock men. Many of the smaller parts such as bolts and nuts are the same for different models. Banks of parts along the conveyor are always kept small.

The scheduled operation of the conveyor line has been worked out by mathematical computations, the basis of which is the labor cost that has been established for assembling each chassis and all these figures are tabulated on an operating chart.

Group Piece Rates for Assemblers

The labor cost for assembling each unit, which on the average requires 73 operations, is established by time studies and the total is equally divided among the assemblers under a group piece rate system. With this cost fixed, any portion of, or a complete assembly is finished within a specified period of time that will keep the labor cost at the fixed figure and at the same time permit the men to earn their established hourly earning rate. The lowest labor cost for assembling a unit as tabulated on the chart is $4 and the range for other types of chassis varies up to $13.75 each.

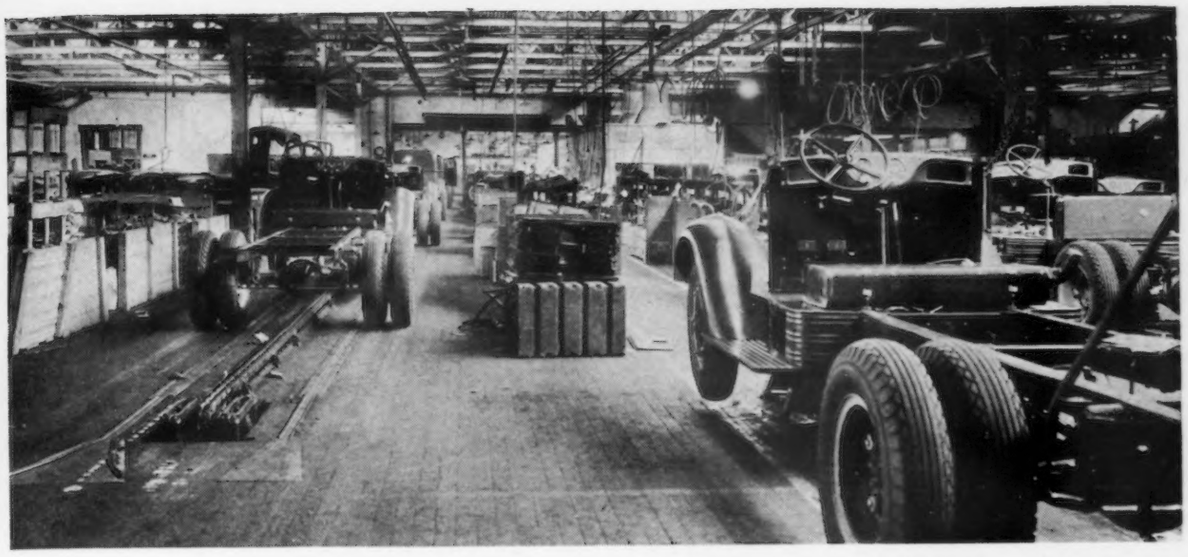
Spacing of assemblies on the line is computed with the assembly cost of the job as the basis. A ratio of 6 to 1 is maintained between the spacing in feet and the labor costs, or 6 ft. of spacing for each dollar of labor cost for assembly. This means that if it costs $5 to assemble a chassis, that particular chassis must be allotted 30 feet of assembly line space. If a $6 job follows a $5 job on the line, the $6 job is allotted 36 feet of space. This spacing principle is maintained and is always the distance between similar points on each chassis, according to cost of assembling.

There are two variable factors in the chassis assembly layout. These are the number of men on the line and the speed of the conveyor chain, both of which as a unit are regulated to meet production requirements. Should requirements call for a greater output of chassis, the increase is effected by adding more men and speeding up the line proportionally.

Certain production schedules are predetermined, and must be maintained. After schedules have been determined, the two variables of man load and speed of conveyor can be determined. This is accomplished in the following manner: Assume that $357 worth of assembly work is to be performed per 7½ hr. day over a period of time, and that the earning rate is to be 70c. per hr. Dividing $357 by $5.25 (which is the amount earned in a 7½ hr. day at 70c. per hr.), we find that the line will require 68 men. Since the conveyor earns $1 for every 6 ft. of travel, the earnings per foot are 16⅔c.; 70c. per hr. represents an earning of $0.0116⅔ per min. per man; 68 times $0.0116⅔ per min. equals $0.8033 per min.; $0.8033 per min. divided by $0.16⅔ per ft. equals 4.8196 ft. per min. or 57.84 in. per min.

In making this computation of conveyor speed the scheduled speed is set fractionally above the mathematically developed speed. Hence, in the case of the example illustrated, the speed of the conveyor is set at 58 in. per min.

The time interval in spacing a chassis on the line is determined by dividing the spacing in inches by the number representing the speed per minute. As chassis costing $6 to assemble are spaced 36



THE other end of the conveyor lines. The overhead hoist transfers the partly assembled truck from the end of the line at the right to the line at the left, and cabs, shields, headlights and various equipment are installed on the chassis while it is moving along this line. The first line passes through a spray booth shown at the right in which chassis are spray painted while moving on the conveyor.

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ft., or 432 in. apart on an assembly line moving 58 in. per min., a new assembly is started every 7.5 min., which is indicated by dividing 432 by 58. Using the method of computation, chassis costing $5 to assemble would be placed on the line every 6.3 min.

The formulae that have been worked out for this system of chassis assembly control are as follows:

Let P=Price of assembly
F=Feet of space allotted
M=Number of men on line
E=Daily earnings per man
A=Inches spacing allotted
D=450 min. (normal working day)
S=Speed of line in inches
I=Starting interval in minutes

Then $F=P\times 6$

And $$S=\frac{\left(\frac{M\times E}{P}\right)A}{D}$$

And $$I=\frac{A}{S}$$

From these formulae a table has been prepared giving all the data needed for any possible production schedules based on the company's hourly earning rate for assembly work. This table shows all the necessary factors that enter into the assembly scheduling. Starting with a minimum of 36 men on the assembly line, columns of figures are provided for spacing on the conveyor chain, speeds, etc., for each two additional men up to 98. Tabulations are provided for scheduling chassis costing from $4 to $13.75 each in labor for assembling; spacing of units on the conveyor from 24 ft. to 82.5 ft. apart, speed of conveyor chain from 2 ft. 10 in. to 6 ft. 11 in. per min. and intervals of spacing in time from 3.5 min. to 29.1 min. This shows the head of the chassis assembly department, at a glance, when a new set-up is to be made, what should be the conveyor speed and number of men to produce the required assemblies and to enable the workmen to receive their piece rate earnings; the factors entering into the speed being only the assembling cost per unit and the number of men employed.

An assembly schedule for each day of the week is made out, and from this a schedule for the day is posted each morning on a blackboard at the start of the assembly lines. Opposite a line of numbers from 1 to 98, the consecutive numbers representing the sequence of the units scheduled for the day's assembly, are columns carrying the car number and the time each unit is to go on the assembly line. If unit No. 15 or the fifteenth chassis to be assembled during the day, is scheduled to start on the assembly line at 10.08 a. m., a delay from the scheduled time of not more than ½ min. is permitted.

To maintain the proper sequence in delivery of parts to the assembly line, a similar blackboard is located at various points where units are assembled. One is located in the basement from where the engines and other sub assemblies are delivered to the line and another in the wiring department from where the cowl comes onto the line. The engine, cowl, cab, front and rear axle, propeller shafts, etc., are each tagged with a number corresponding to chassis numbers to which they are to be assembled which assures the delivery of the correct parts for each chassis assembled.

A speedometer on the line shows the speed of the conveyor in inches per minute and also how many feet the conveyor has moved in a given time. This is a constant visible record which shows the men on the line how they are maintaining their schedules. Should the conveyor chain stop, a red light is shown at each end as a warning signal.

▲ ▲ ▲ PLASTICS—Competitor

o o o

By FRANKLIN E. BRILL
General Plastics, Inc.

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MANY fabricators view plastics as a serious competitor for their business. There is no doubting that applications of plastics have multiplied, therefore it should be of interest to examine specific applications and the various limitations of this comparatively new material. The author cites these limitations, but for the most part concentrates on certain molded items, with particular emphasis on the reasons why plastics were chosen for these parts rather than pressed or cast metal.

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IN the last few months many new products have appeared with molded plastic cases or major parts which heretofore would have been stamped or cast metal. Consequently, metal fabricators have looked upon these molded products either as a threat, a helpful ally, or a mixture of both. It is interesting to attempt an analysis of the problem to the end of determining in which of these three categories plastics rightfully belong.

To study the problem, the following factors should be considered: Are the products possible only in plastics? Did they replace metal, or are they applications where metal couldn't qualify anyway? Why was plastic material used instead of metal?

Seeking answers to these questions, General Plastics, Inc., recently sent out questionnaires to the chief engineers of a number of companies using structural molded plastic parts in preference to metal, asking them the reasons for their choice. The replies fell into the following seven classifications:

(1) The job required permanent finish that wouldn't chip.

(2) The lightest possible weight was essential.

(3) The insulating properties of plastics were desirable.

(4) A pleasing, non-metallic touch reaction a major sales point.

(5) The shape didn't lend itself to stamping.

(6) There is greater design possibilities in plastics.

(7) The lower cost in plastics.

Although these products ranged from adding-machine cases to radio parts and auto accessories, they represent only a small part of the metal fabrication market. Thus plastics can not yet be considered a major threat, for plastics have the following definite limitations: The tensile strength of phenolic material runs between 5000 and 10,000 lb. per sq. in. as against over 13,000 for zinc and 75,000 to 100,000 for stamped steel; their transverse strength runs to 12,000 lb. per sq. in. as against approximately 10,000 for zinc and about 20,000 to 35,000 for aluminum. There are also limits to the practical size of a molding, which when exceeded, makes the unit price excessive. It is dimensionally as stable as most metals, but ordinarily absorbs some moisture from steam or humid atmospheres. Against this, though, one can cite that phenolic moldings when properly designed, have adequate strength for all but heavy-duty applications, and can be made into such pieces as 18-in. scale housings at less cost than porcelain-enameled iron. The absorption of moisture in humid air by phenolic material is so slight as to be negligible, and its molded gravity is 1.35 as against over 7 for zinc and 2.70 for aluminum alloy. It is apparent, therefore, that molded plastics

or Ally? ▲ ▲ ▲

FIG. 1 — Telephone bases have usually been die-cast and japanned. One company is now turning out this type of molded plastic base at a lower cost. Metal parts of the instrument are also shown here.

have a definite, *but limited*, scope of use in making today's products.

Applications of Plastics

Definite applications can be cited to illustrate the scope of plastics. Telephone handles have been made of phenolic plastics for years, and of hard rubber before that, but the hand-set bases have heretofore been die-cast and japanned. In considering various materials, Leich Electric Co. was attracted mainly by the fact that molded plastic bases, unlike most enameled metal surfaces, could not be chipped or scuffed or scratched, and that they would be lighter in weight than *any* metal. Molded bases are shown in Fig. 1. When costs were figured, they found the molded base was actually less expensive than a japanned die-cast base, mostly because the base comes from the mold with its shiny finish automatically formed. Fig. 1 also shows the many metal parts used in a Leich telephone, viz., a cast cradle and switch and stamped dial plate, threaded bushings and rings, inserts, etc.

Next consider a vacuum windshield defroster illustrated in Fig. 2 and made by Bishop & Babcock Mfg. Co. The chief engineer, H. J. Findley, says that, "The shape of the case didn't lend itself to stamping, and since weight was a prime factor, plastic material was selected. Variety of finishes obtainable in plastics was another reason. Also we decided to mold the internal parts, rotor wheel, fan and bearing case cover, of the same material because of its light weight and lack of resonance to high-speed air-current noises."

FIG. 2—This windshield defroster is made externally and internally of plastics. If the maker had only metal to choose from, it is doubtful whether this item would have been put into production.

Therefore, in this application a plastic is used for a product that probably wouldn't have been made if the manufacturer had only stamped and die-cast metal to choose from. Its intricate interior and exterior couldn't have been stamped economically, and its weight would have been excessive if die cast. Cost was secondary here, but moldings are usually competitive in cost with well-finished zinc die-castings and fairly complex plated or japanned steel stampings.

Taking another auto accessory as an example, consider the case of the Arvin radio control which is made of plastic materials by A. G. Redmond Co. A molded case is used instead of metal for the following reasons: Sales appeal, arising from the smooth, lustrous finish which matches motor-car interiors; durable surface, which means that the finish can't wear off as it might from constant handling of an enameled die-casting; light weight and non-resonance in vibration periods; and, finally, transparency of the ivory molded bezel when the control unit is lighted.

Cost Comparison

For a direct cost comparison between stampings and phenolic

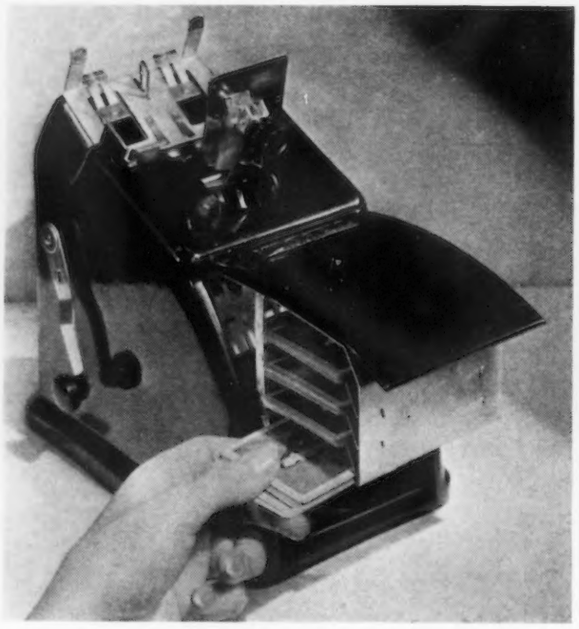


FIG. 5—Four devices with molded Durez housings, chosen in preference chip-proof surface, and, in

moldings, the telephone bell-box illustrated in Fig. 4 is a good example. Formerly a stamping was used which required nine production operations, i. e., blanking, forming, trimming, grinding, sandblasting, phosphate-finishing, scratch-brushing, japanning and baking. The box is now a phenolic molding which pops from the mold complete in one machine operation, except for a fin removal which is a quick file operation.

The fact that the finished molding was less costly even though the molding powder is much more expensive than sheet steel is simply because of the fewer hand operations required. Actually, the deciding factor that swung the job to plastics was not so much the cost as the durability of the plastic finish. That is, chair-legs and tables could not chip it off and hard bumps could not dent it.

Although most readers are probably familiar with the molding process it might be of interest to review briefly the operation. The machine used is a hydraulic press, fitted with a cored steel mold consisting of multiple cavities and plungers, through which steam is circulated to heat it to about 350 deg. F. Into the cavities are loaded pellets of powder (processed from chemicals, mostly phenol), the press is closed and then opened after the powder has softened, filled the cavities and hardened, which takes from a few seconds to several minutes depending on the size of the piece. Fin removal is the only other operation required after the pieces are ejected.

Returning to cases again, note the molded plastic housings on the four machines grouped together in Fig. 5. On each job, the reasons for the selection of plastics were different: The Barrett adding machine housing was molded for permanence of finish, because the surface of office equipment like this receives a lot of rubbing and handling. Light-weight and non-resonance were again factors, too, and the cost of the molding was slightly less.

The satchel-shaped device with the glass vessel in front is the Hanau dental electroplater, and its housing was molded because splashing of the plating acid would have damaged most enamel finishes. This acid does not effect the inert plastic. The molded case stopped electric shocks, and it had lighter weight and greater resistance to scratches and dents as additional advantages. The cost is about the same as cast metal aluminum.

Also of interest is the reason given by the Andiss Mfg. Co. for the selection of phenolic moldings for the giant Speed-Whip fountain mixer case, illustrated in Fig. 5. Since cleanliness is paramount in fountain appliances, Andis designers were afraid that enameled stampings and castings might chip, exposing rust-forming and germ-harboring pits. Weight was also considered, and since the internals of the Speed-Whip is a heavy load for one person, it would have been seriously excessive if it

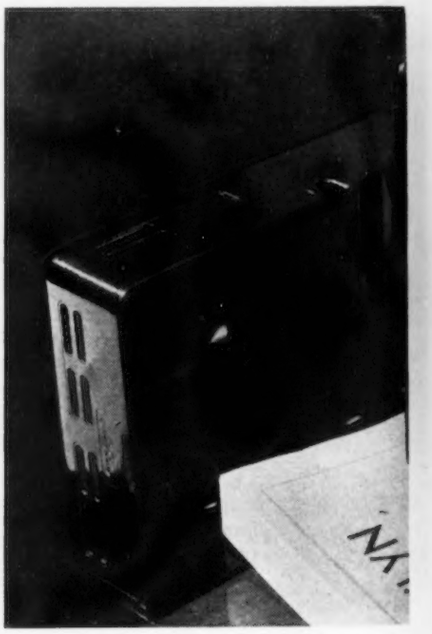
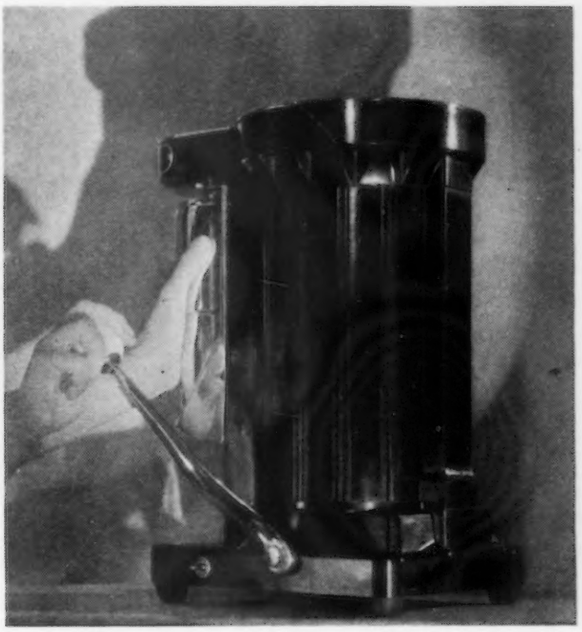


FIG. 4—A former metal stamping is displaced surface. Also, seven produc

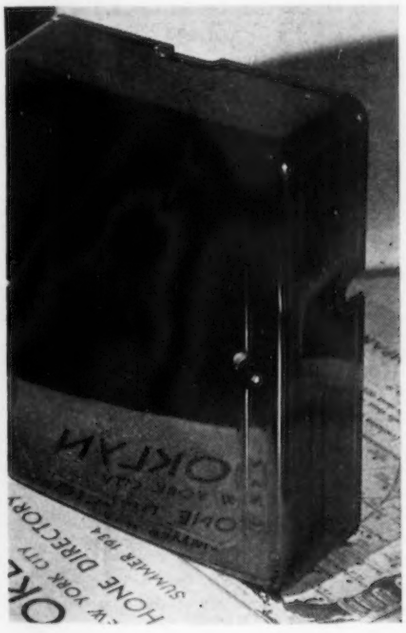


to metal because the plastic is lighter in weight, is wear proof, has a one case, must be acid proof.

had been cast. Many of the supporting parts, terminals, oilless bearings, threaded inserts, etc., were molded into the plastic parts, further reducing weight. Cost of the moldings was slightly less than die-castings.

Still another device shown in Fig. 5 is an automatic card shuffler made by the I-Deal Corpn. Metal was not even considered because of the need for a surface pleasing to the touch and an extremely light-weight housing. This device is passed around card tables and receives considerable handling and thus the peculiarly pleasant, not-too-cold-not-too-warm molded surface is an advantage. Even the hinged front cover is molded, mostly to match the main housing and to simplify attaching the metal parts and hinges.

From the above, one interpretation could be that plastics are already a competitor of metal; the other is that at present they are supplementing metal and taking only a small percentage of business from the older materials. Certainly there is room for both metals and plastics in the rapidly enlarging manufacturing scene. And when one considers the tonnage of steels used by the plastics industry, in processing the chemicals, grinding, shipping and pre-forming the powder, in the huge presses, and ever-changing steel dies, one wonders whether plastics aren't actually benefiting rather than threatening the growth of the metal industry.



by a plastic, mostly to obtain a chip-proof tion operations are avoided.

Useful Data on Lubricating Greases

USEFUL information for plant executives, engineers and others responsible for the selection of greases is contained in an 80-page bulletin on "American Lubricating Greases," written by James I. Clower, assistant professor of machine design, and published by the Virginia Polytechnic Institute, Blacksburg, Va. The bulletin discusses manufacture, uses, testing and application of greases, the data being presented from the viewpoint of the user rather than that of the manufacturer. It contains 23 illustrations, 13 tables and a large three-fold condensed inserted table giving various classifications, the ingredients and uses of a number of greases. Copies may be obtained from either Professor Clower or the director of publications of the Virginia Institute. A previously published bulletin on "Lubrication Oil Tests" is also available.

Internal Cleaning of Closed-End, Bottle-Neck Parts

By L. M. WAITE

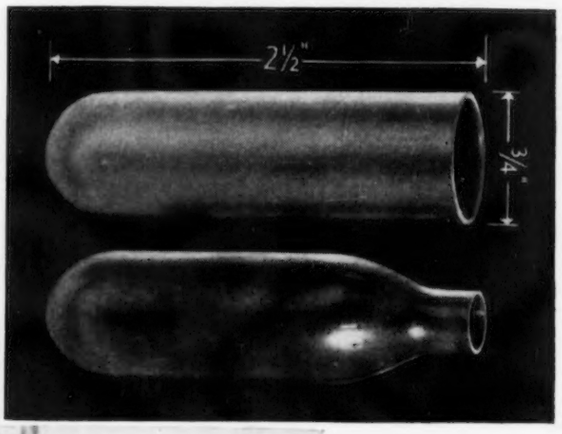
THE illustrated metal cleaning and drying equipment serves in the removal of oil, grit, and odor from supercharger bulbs such as are employed in connection with syphon bottles, common to the mixing of beverages. The cleaning takes place in two stages of bulb production; Fig. 1, drawn, with open end trimmed; Fig. 2, open end reduced to final contour.

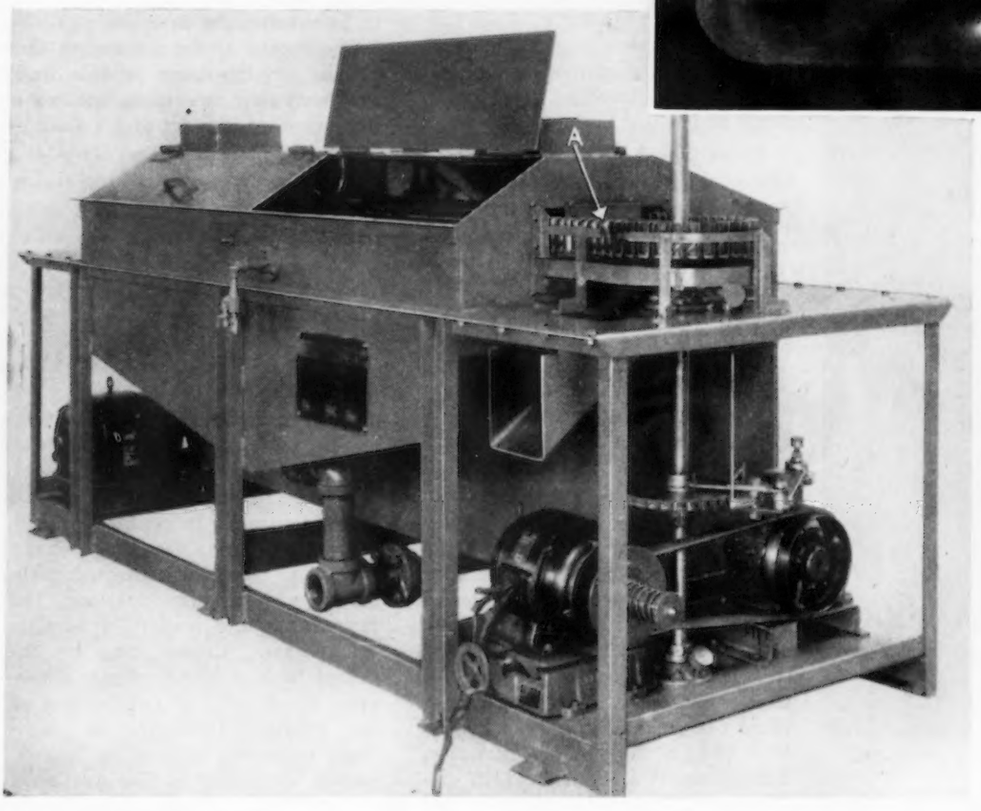
The machine, designed by Metalwash Machinery Co., Inc., 27 Haynes Avenue, Newark, N. J., consists of a heavily constructed steel tank, reinforced and supported by structural members. Welding is employed throughout and involves over-lapping double welded seams, welded entire lengths.

Each end of the base is provided with an extension upon which the driving mechanism and pump equipment are oppositely mounted. Above these, table extensions provide ample space for magazine

BELOW

FIG. 3—After cleaning and drying processes, bulbs automatically eject themselves from magazine-like retainers, as shown at "A." The retainers are permanently attached to conveyor-chain links.





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ABOVE

FIGS. 1 and 2—In cleaning the particular closed-end or bottle-necked parts as herein described, cleaning operations are performed at two stages of parts production. The first, after drawing and open-end squaring, but prior to closing in the reduced diameter end; the second, after the parts have been contoured or necked to final form.

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FIG. 4—The rotating end unit is slidably mounted and is provided with screw and lock-nut adjustment as shown at "B." A metal cover affords protection but is easily lifted if and when it is desired to inspect the work in process.

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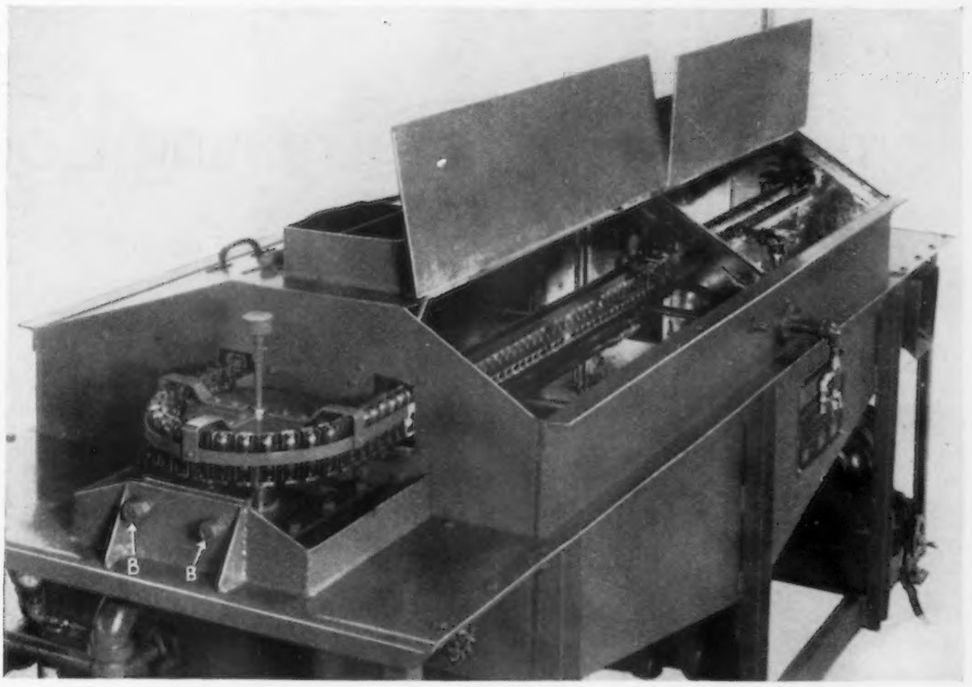

loading and discharge at one end, Fig. 3, and for work-in-process inspection and any necessary chain take-up by screw adjustment, at the other end, Fig. 4.

A chain conveyor travels longitudinally within the machine chambers, but is vertically positioned with respect to loading table and driving sprockets. This provides for the attachment of a vertical magazine to each chain "link," for carrying the work pieces through the processes of cleaning and drying. The drive is through a vertical shaft by means of a motor driven speed reducer and a variable speed pulley, as shown in Fig. 4.

Adjustably timed halting of the conveyor feed is by crank motion, operated from the output shaft of the vertical speed reducer. This motion operates a pawl and ratchet, intermittently turning the vertical drive shaft, thus giving desired periods of "stop," "go" and spac-

[CONCLUDED ON PAGE 104]

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FIG. 5—The sousing guard, shown in the foreground, has its normal position within the covered sections where it serves to take the force of solution under pressure and re-direct it for continuous washing duty.

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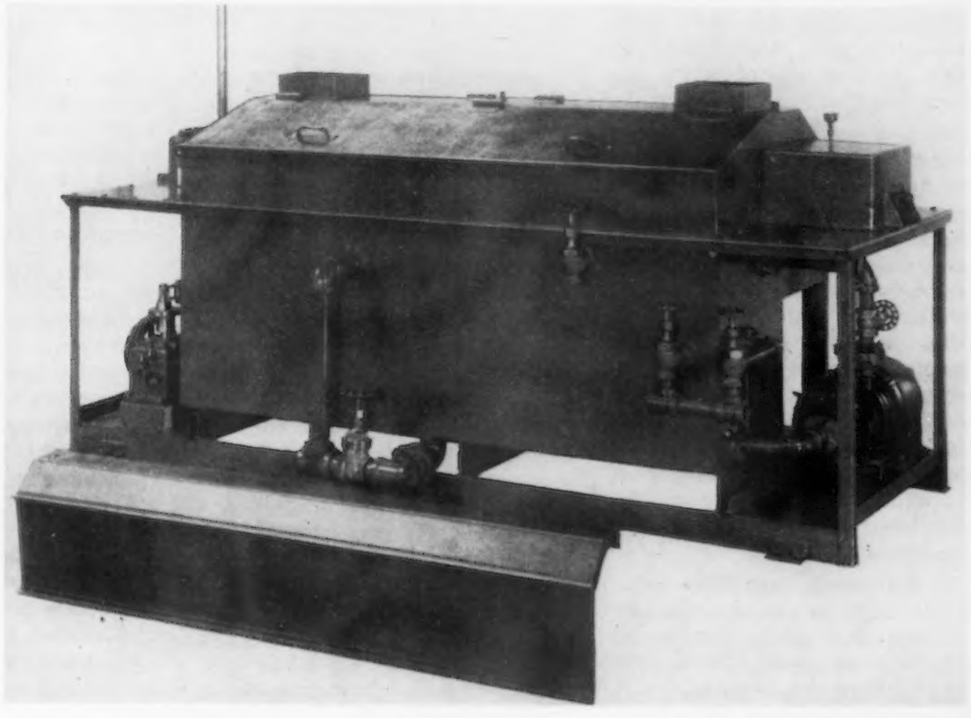

Forging and Heat Treating Locomotive

By J. B. NEALEY
American Gas Association

ONE of the world's greatest transport systems, the Pennsylvania Railroad, maintains extensive shops at Altoona, Pa., for the repair and building of cars, locomotives and tenders. Here were built the new and famous streamlined electric locomotives (GG-1 type) which broke all previous speed records on the trial run between New York and Philadelphia. Of greatest interest to many are the two forge shops at Altoona, known respectively as Blacksmith Shop No. 1 and Blacksmith Shop No. 2, where many of the parts for these locomotives were forged.

Roughly, these shops can be described as two long buildings with rows of furnaces, steam hammers, forging presses and jib cranes on both sides. Overhead cranes serve Blacksmith Shop No. 2. There is also a boiler shop where large steel plate parts are formed. Gas is the standardized fuel throughout. Only carbon steels are used for the forgings, the analyses of which are given herewith in tabular form.

Shop No. 1 is 80 ft. by 516 ft. long and contains 11 furnaces serving hammers of various types and sizes with several giant steam hammers in the center. Heavy sections are worked mostly in double frame hammers and are handled by jib cranes. Parts such as piston rods, locomotive driving rods and equalizers, center plates, spring hangars, brake levers, adjusting rod boxes, king bolts, knuckle joint pins, shifting valve covers, etc., etc., are forged here. The furnaces are of brick and refractory construction, steel encased, and of various sizes and types.

In Blacksmith Shop No. 1 there are installed two three-chamber furnaces used in the forging of main and side rods. These rods are afterwards heat treated and it is, therefore, very important that the cold billets are not subjected immediately to excessive heat. These three-compartment furnaces are so designed that the waste gas products formed in the two outer chambers are discharged through heat tunnels to the center chamber, thereby maintaining in this center chamber a temperature of approximately 800 to 1000 deg. F.

The cold billets are placed in this chamber and after being heated to approximately 900 deg. F. are then transferred to either one of the end forging chambers, where they are heated to a forging temperature of about 2250 deg. F. Approximately 2¼ hr. is required to bring the billets from 900 deg. F. to 2250 deg. F.

There are two drop forge furnaces, each 6 ft. by 9 ft. long, with two front doors and four gas burners, two in each end. One of these furnaces is shown in Fig. 1. A center wall, which rises part way to the roof, was installed so that the operators can work out of either compartment without materially reducing the heat in the other. One of these hammers is rated at 12,000 lb. and the other at 16,000 lb. A hydraulic trimmer is close by. Most of the other furnaces are about the same size and type, but contain only one chamber. The hearths of the smaller ones are 4 by 5 ft.

Formerly, the furnaces in these shops were producer gas or oil fired but the changeover to city gas effected several economies and practically eliminated the smoke nuisance. Venturi type gas burners are used, 80 lb. air inspirating gas dropped to zero pressure in a governor. The burners fire through refractory tunnel blocks set in the furnace wall and a space of ½ in. is left between the burner tip and the steel shell of the furnace. This reduces the furnace pressure and eliminates stingers or flames from around the doors.

THE author explains in detail the forging and heat treating practices as well as the equipment used in the Pennsylvania Railroad shops at Altoona, Pa. It is pointed out that several economies were effected when furnaces in the shops were changed from producer gas or oil over to city gas. Likewise the author mentions the methods by which old scrap is reclaimed, not by remelting but by reheating, after which it is forged into new shapes for new uses. Thus the railroad can profitably use accumulated wrought iron scrap, old axles, etc.

Scrap Reclaimed

Reclamation of scrap is a large item here, an example being small wrought iron scrap, which is bloomed into billets. This is accomplished by making a cross pile of old wrought iron arch bars and miscellaneous short pieces, which are charged into a furnace with a pallet swung from a jib crane. When hot, the mass is removed with tongs and put under a hammer, where it is worked into billets and shapes and these are then drop forged into various items such as 200-lb. locomotive equalizers.

Parts ▲ ▲ ▲

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A RAILROAD'S dependability is taken as a matter of course, inasmuch as all important lines have for many years concentrated on the development of trustworthy personnel and fool-proof equipment. Many of the vital members of this modern locomotive are forged or heat treated, and the generally excellent service life of these parts is a testimonial to correct production practices in company shops. A detailed résumé of these practices is contained in the article which follows.

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Some of this is done by forging on the working heat and then finishing on a reheat. Freight car center plates are formed from hot scrap under drop hammers to shape and then trimmed on the same heat.

In either forging or drop forging, care should be exercised in selecting the grade and approximate size of the material. Sufficient reduction should be made at the points of maximum stress to insure a "packing" of the grain. Forgings and drop forgings should be so made that the grain fiber does not end abruptly at any one point, but will preserve a continuity of fiber, thus eliminating any tendency for sudden rupture. The rate and duration of heating should be carefully guarded, as either operation performed improperly is not conducive to a sound finished product.

Old axles are sometimes heated and worked down into rectangular or square sections and forging blanks cut from these. Bushings and other items are made in this way. All dies for this and other work are made in the company's own tool and die shop.

No. 2 Shop is 80 ft. by 400 ft. long and contains six drop hammer furnaces, 18 smaller furnaces for swing belt hammers and forging machines, forges or tool dressing or hardening, six car-bottom and four cylindrical vertical furnaces for various kinds of heat treatment. The furnaces serving the hammers are of the gas-fired box type, similar to those already described.

Annealing, prior to machining, is accomplished in the car-bottom furnaces. Each of these is 7 ft. by 12 ft. long and is fired with 16 gas burners, eight on each side. The burners are arranged to fire both above and below the work, the lower ones firing through refractory tunnel blocks which form the car top and on which rests a layer of firebrick to form the hearth. The hot products of combustion rise up around the sides and into the furnace chamber. Each side wall contains four vertical vents for the waste heat. Drive rods, piston rods, crankpins, crosshead pins, valve gear motion parts and other locomotive parts are treated in these. The work is put into a furnace with a temperature of 300 deg. F. and is brought up to 1450 to 1500 deg. F. at the rate of 200 deg. per hr., after which it is soaked at this heat for 2 hr. The gas burners are then turned off and it is allowed to cool in the furnace. Most of these parts have carbon ranges of 0.40 to 0.50 and 0.45 to 0.60.

Some of these parts are later hardened and both the cylindrical vertical and car-bottom type furnaces are employed for this pur-

pose. Each cylindrical vertical is 6 ft. in diameter and 18 ft. deep and they stand in pits about 12 ft. deep. Heat is supplied to each by 12 gas burners arranged spirally around the furnace and firing tangentially to the inner wall. The quench tank is rectangular and of concrete and is 12 ft. square and 14 ft. deep. The cylindrical oil quench tank is located in one corner of the large water quench for such parts as require cooling in oil. The water around this tank tends to cool the oil. The work is handled by a fixture, swung from an overhead crane and hoist. Parts made from steel of the lower carbon range 0.40 to 0.55 are heated to 1450 to 1500 deg. F., quenched in water and drawn at 1000 to 1100 deg. F., while those of the upper carbon range 0.45 to 0.60 are cooled in air after heating, and drawn using the same temperatures.

The heat treating furnaces are all equipped with automatic temperature controls. All work that is heat treated bears a serial or heat number and that heat number is also put on the pyrometer chart. This chart is filed so that in the event of a failure or unsatisfactory performance of the heat treated part, by referring to the serial number on the piece in question, the chart can be produced and treatment shown.

Carburizing Practice

Other parts such as knuckle joint pins and bushings, valve motion pins and bushings, brake rigging pins and bushings, etc., are carburized and hardened to a depth of 3/32 in. For this purpose there are two single-door box-type furnaces 4 ft. by 5 ft., and each is heated with three gas burners underfiring the hearth from one side only. One of these furnaces is pictured in Fig. 2. The parts are packed in boxes 14 in. by 18 in. by 4 ft. long, which are pressed from hot steel plate betwen dies in a hydraulic press in the boiler shop. Ordinary carburizing compound is employed. Selective carburizing is used on bushings, as the inside surface only is case hardened. A number of these are piled up and bolted rigidly together between two plates. The center is filled with the compound and the whole is heated.

Of carbon steel, Grade A, these parts are carburized at 1750 deg. F., cooled in the box, removed from the box when cold, and are reheated to 1450 deg. F., for quenching. The same furnaces are used for the second heat but the compound and boxes are omitted. There is a central control room where visual pyrometers for all these furnaces are located on panels.

The boiler shop is 80 ft. by 723 ft. long with overhead cranes and much of the heavy plate work is formed, machined and fabricated here. Of interest are two hydraulic presses of 700 and 1200 tons respectively, served by two large double-end gas-fired furnaces. This set-up is employed to heat and form heavy boiler plate into locomotive throat sheets, crown sheets, domes, fire box sheets and other locomotive and car parts. One of these furnaces, as shown in Fig. 3, is 14 ft. by 15 ft. by 16 ft. long, outside, and inside is 9 ft. high from hearth to top of arch. Heat is supplied by 10 gas burners, five on each side. The front and back doors are built in three sections to admit partially formed sheets; the two side sections move back and forth on rollers and rails, while the center and upper section is lifted by a hoist. The bed of the largest press is 12 ft. by 16 ft. and holds a platen with a die, which is moved up with a hy-

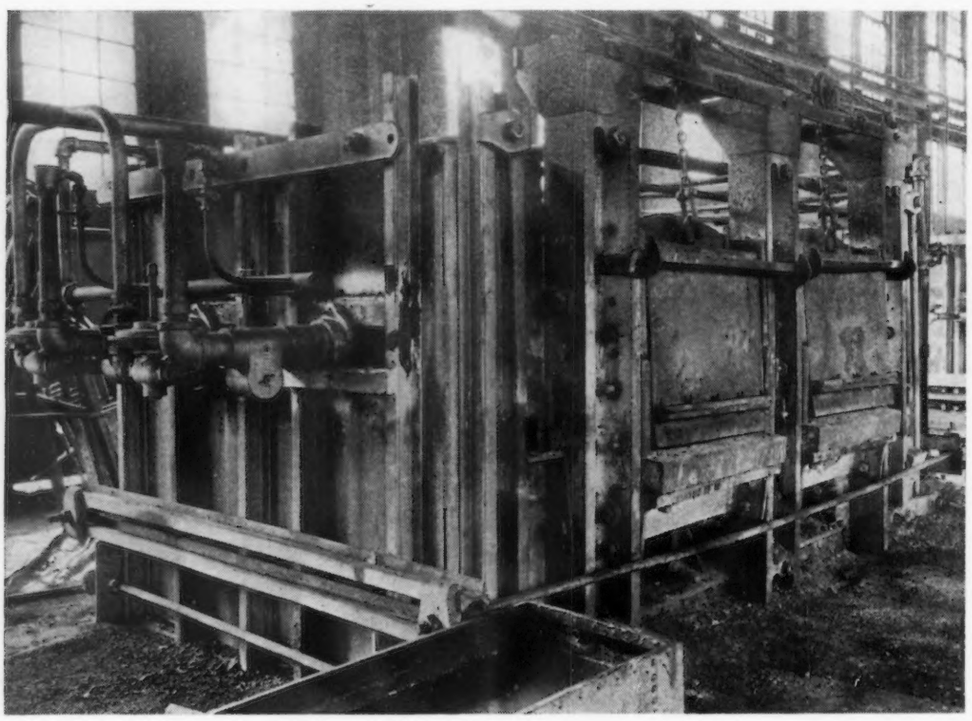

FIG. 1—Two drop forge hammers in Shop No. 1 are supplied with billets from two furnaces, one of which is shown here. This furnace is of the two-door type with a partial separating wall. City gas is used, firing through two burners in each end.

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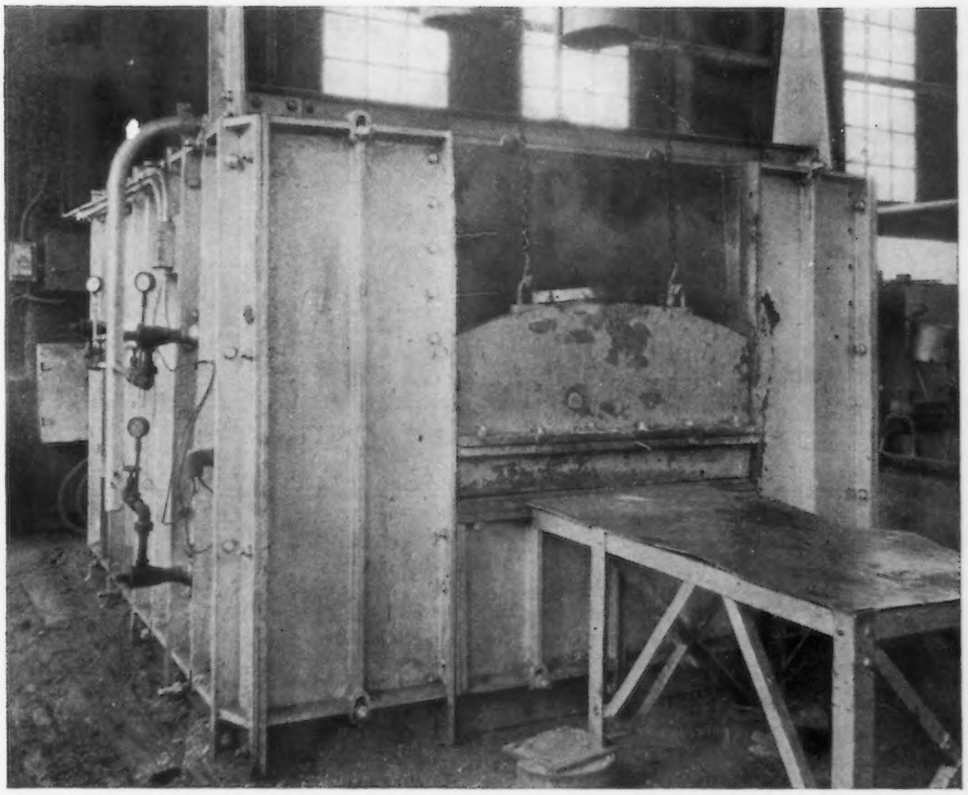

FIG. 2—One of the furnaces in Shop No. 2 used to carburize various locomotive parts. This is a single-door box-type furnace having three gas burners under-firing the hearth from one side.

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draulic piston against a stationary die attached to the top platen. The top platen is held in place by four heavy steel posts. This press has an 8-ft. stroke. The work is heated to 1700 deg. F. for forming.

Causes for failure of steel parts in service are many and varied, some of the most common being: (1) faulty design, (2) rough surfaces, (3) poor quality steel, (4) improper forging temperatures or practices, and (5) improper heat treating temperatures or methods.

Briefly analyzed, these causes are as follows:

(1) Faulty design often permits of sharp corners where it is quite possible to place a healthy fillet or radius and thus eliminate a point where stresses may concentrate,

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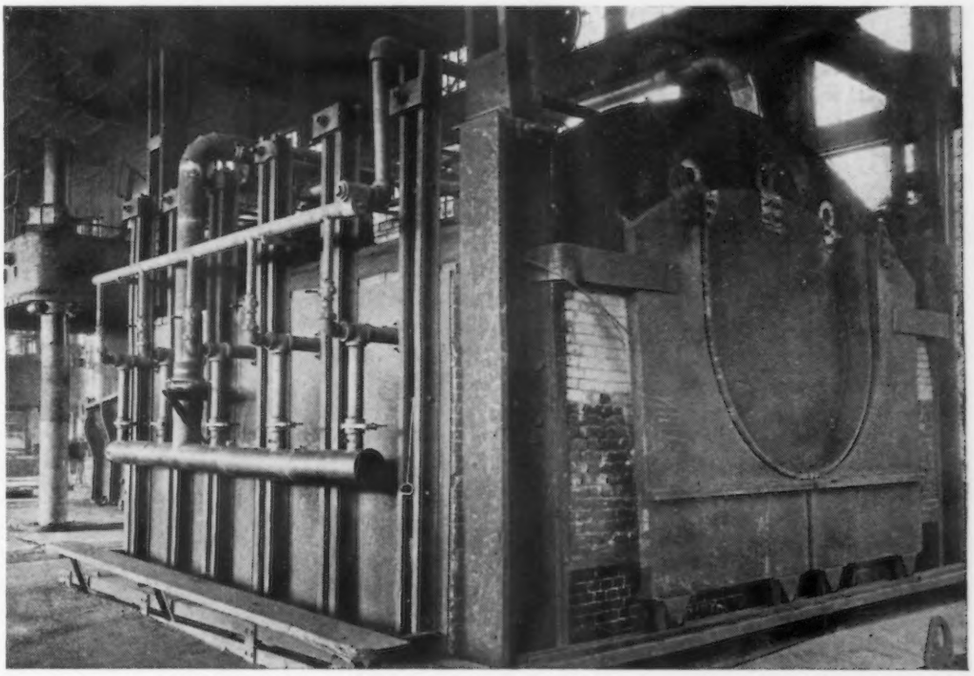

FIG. 3—In the boiler shop heavy plates are pressed into locomotive throat sheets, crown sheets, domes, etc. This is one of the furnaces used for this work. Heat is supplied by 10 gas burners, 5 on each side. The door is made in three sections.

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improper distribution of weights in relation to static or repeated stresses under service conditions.

(2) Rough machining often leaves deep scars or tool marks which are excellent places for fractures to start, commonly called detail fracture but properly named "progressive fracture."

(3) Poor quality of steel such as "unsound," "segregated," "porous," "piped," "seamed," "lapped," is more often the cause of failure. It has frequently been found that steel of unsound constitution has withstood the strains set up in heat treatment (all heat treated or hardened steel is in an unstable state of equilibrium) and has withstood proof testing only to subsequently fail after a short service time. This failure usually discloses gas or slag inclusions or segregations of constituents.

(4) Already discussed.

(5) The heat treating operation which, in the past, has been the object of much misplaced criticism is very important and should be governed by all the safeguards modern science has to offer.

First, as stated before, any piece of hardened metal is in an unstable state of equilibrium since during heat treatment certain strains must be set up to obtain the desired physical properties. The steel should be of such constitution that the strains necessarily set up will not dangerously approach the limits of elasticity or ultimate strength. The critical temperatures should be predetermined and the temperatures so used should not exceed, by any great degree, this limit; parts should be initially preheated slowly so that unequal expansion will not start ruptures; heats should be advanced at correct rates and maintained only long enough to permit a thorough and even heating, as any excess duration of heating at or above the critical temperature tends to increase grain size with a corresponding loss of strength.

TABLE I

Specifications for Cabon Steel Billets

Class of Steel	A		B		C	
Minimum and Maximum Content, Per Cent	Min.	Max.	Min.	Max.	Min.	Max.
Carbon	0.15	0.25	0.40	0.55	0.45	0.60
Manganese	0.30	0.50	0.40	0.70	0.60	0.90
Silicon	...	...	0.10	0.30	0.10	0.30
Phosphorus	...	0.05	...	0.05	...	0.05
Sulphur	...	0.05	...	0.05	...	0.05
Chromium	...	...	...	0.30	...	0.30
Nickel	...	...	...	0.40	...	0.40
Vanadium	...	...	...	...	...	...

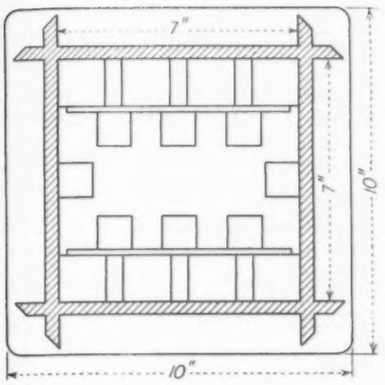
TABLE II

Specifications for Steel Bars

These specifications cover the various classes of steel bars used for locomotive, car and stationary boiler construction, classified as follows:

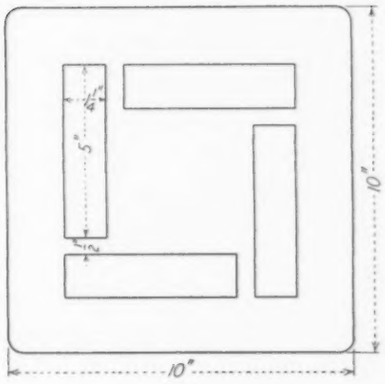
Class A is used for bars for locomotives, cars and general service.
Class B is used for bars for stationary boilers.
Class C is used for bars specified as "axle steel," for bolts and other purposes.
Class D is used for bars for superheater header bolts and for set screws.
Class E is used for bars for drop forgings.

Class of Steel	A		B		C		D		E	
Minimum and Maximum Content, Per Cent	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
Carbon	...	...	...	...	0.40	0.55	0.50	0.60	...	0.12
Manganese	0.30	0.70	0.30	0.70	0.40	0.80	0.40	0.80	0.30	0.70
Phosphorus	...	0.05	...	0.04	...	0.05	...	0.05	...	0.05
Sulphur	...	0.06	...	0.05	...	0.05	...	0.05	...	0.06



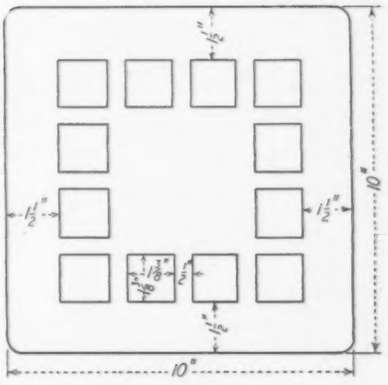
(a)

FIG. 1-A—Inserts set up for casting the "bird-cage" type bar. The larger inserts of hard steel are 1⅜ in. and the smaller ones are 1 in.



(b)

FIG. 1-B.—Inserts of hard steel set up for casting the "box" type bar..



(c)

FIG. 1-C—Shows the arrangement of hard steel inserts set up for casting channels.

Composite Steels for Jail Use Must Meet Rigid Specifications

RECENT adoption of standard requirements by New York State for steel to be used in penal institutions has set a precedent which other States are gradually accepting. While this trend for standard specifications places a greater responsibility upon the steel maker to produce a steel capable of meeting more rigid requirements, at the same time it simplifies his problem by permitting concentrated effort in research and development toward improved quality.

Obviously, the primary specification for jail steel is that it be as nearly "fool-proof" as possible. "Composite" steels have been meeting this requirement effectively. This steel is composed of two or more distinct types and analyses, the combination of which is highly resistant to sawing and breaking, the two most common methods of jail breaking.

Hard Steel Inserts

Composite steels for this purpose are formed by several methods which are more or less general practice in the industry. In its construction, the important feature is in the arrangement of hard steel inserts which are covered with a steel of a softer composition.

In arranging the hard steel inserts in the ingot from which bars and channels are made, the New York specifications require that there be not less than 12 such inserts in each bar, and that the covering of soft steel be not more than ⅛ in. thick; the inserts to be so placed in the bars as not to permit drilling at any point with a ¼-in. drill to more than ⅛ in. in depth. The illustrations show different arrangements of hard steel inserts as they are placed in molds ready to receive the poured softer steel in which the inserts are completely enveloped, thus forming the ingot from which composite bars and channels are made.

These arrangements of the inserts form what is known as the "bird-cage" type bar now specified by New York State and in general use today. In producing this type of bar a multiplicity of smaller inserts of the hard steel are arranged symmetrically to the periphery of cross-section of the mold. For example: if the ingot has a square cross-section, the inserts also are arranged in a square, but the square composed of the inserts is smaller than the mold. The percentage of soft material desired on the finished bar determines the size of the insert arrangement as compared with the ingot cross-sec-

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New Open-Hearth Checker Increases Efficiency of Regenerator Chambers

By M. K. MELLOTT
Pittsburgh, Pa.

THE need for greater efficiency in the regenerator chambers of open-hearth furnaces has resulted in the design of a new open-hearth checker brick by the William M. Bailey Co., Pittsburgh.

In designing this checker, consideration was given to several features, acknowledged to be important in obtaining maximum efficiency in regenerator operation, i.e., greater heating surface, increased flue area, sufficient structural strength, ease in cleaning, and increased volume of combustion air through the checker chamber.

The checker is made for any standard size flue, with a brick depth of 2½ in. or 3 in., and a thickness as close to 2 in. as commercially practical. Reference to Fig. 1 shows a drawing of the size used in forming a 5-in. flue. Reference to Fig. 2 shows the dimensions of four standard sizes.

It will be noted in illustration Fig. 3, that in laying up the Superior checker in a checker chamber, each checker is interlocked with adjoining checkers at all four corners, and each course of checkers is locked into the adjoining course, thereby preventing shifting or twisting and the obstruction of the flues.

Free Area Important

All studies on the subject of regenerator efficiency prove the importance of exposed heating surface in the checker brick. Acknowledgment was given to this feature in designing the Superior checker. However, it is now an acknowledged fact that the free downward area per horizontal checker area is of equal importance, and for this reason, the designer endeavored to obtain a free area of approximately 50 per cent, even though with certain brick sizes it meant the sacrifice of some exposed heating surface.

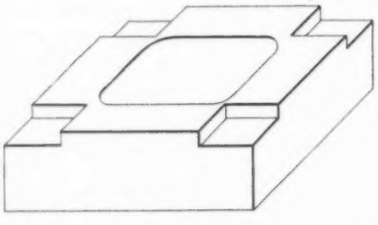

FIG. 1—General form of checker recently developed by William M. Bailey Co., Pittsburgh.

Results obtained in producing maximum heating surface and free area with the Superior checker design, as compared to standard 9 in. by 4½ in. by 2½ in. bricks, are shown by the following data. Also refer to the table. The standard brick laid up to form a 6 in. by 6 in. flue shows 4.70 sq. ft. of heating surface per cu. ft. of space, and 33 per cent of free area. The Superior checker, with the same size flue, shows 5.564 sq. ft. of heating surface per cu. ft. of space, and 52½ per cent of free area, or an increase of 18 per cent in heating of surface, and 60 per cent of free area, or actual flue area per cross section. In another case, a standard 9 in. by 4½ in. by 2½ in. brick laid up to form a 5 in. by 5 in. flue, shows 5 sq. ft. of heating surface, but only 28 per cent of free area. In comparison, the Superior checker with a 5 in. by 5 in. flue

gave 6.15 sq. ft. of heating surface with 48.9 per cent free area, or an increase of 75 per cent in free area and 23 per cent in heating surface.

The table also shows the number of brick per cubic foot in two standard sizes of Superior checkers, the weight per brick in lb. per cu. ft., percentage of free downward area per horizontal checker area, and the effective heating surface per cubic foot.

The large free horizontal area obtained with the Superior checker offers a minimum of resistance to the passage of combustion air through the checkers, thus assuring an increase in the quantity of this primary air and thereby correcting in a major degree one of the weakest points in open-hearth furnace operation.

This new checker was placed on the market in June of this year. Up to the present time one of the open-hearths of a large eastern steel plant has been relined with the Superior checker, and two additional ones are on order for two other steel company plants.

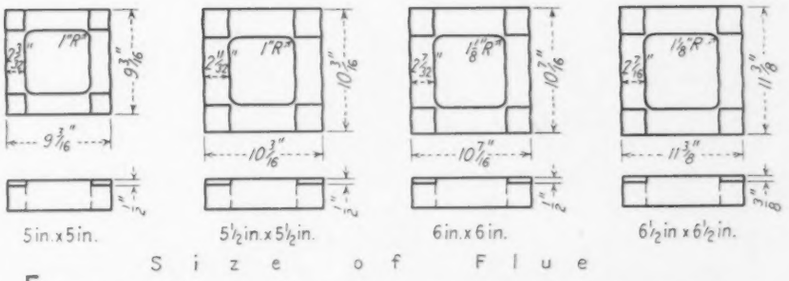

FIG. 2—Overall dimensions of four standard size Superior open-hearth checkers.

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FIG. 3—Photograph of an open-hearth checker section built up with recently developed Superior checker brick. Note the interlocking arrangement.

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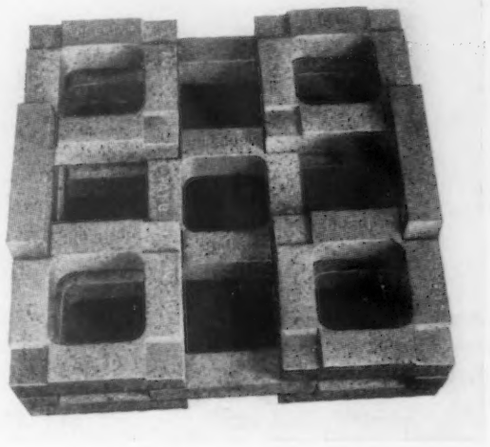


COMPARATIVE DATA ON STANDARD AND SUPERIOR OPEN-HEARTH CHECKERS

Size of Flue	5 In. by 5 In.			6 In. by 6 In.				
		Superior Checkers			Superior		Superior	
Size of Brick	9 by 4½ by 2½ In. Flat	2½ In. Deep 2 3/32 In. Walls	3 In. Deep 2 3/32 In. Walls	9 by 4½ by 2½ In. Flat	2½ In. Deep 2 7/32 In. Walls	9 by 4½ by 3 In. Edge	3 In. Deep 2 7/32 In. Walls	10½ by 4½ by 4½ In.
Nine in. equivalent	1.00	1.49	1.80	1.00	1.84	1.28	2.23	2.24
Number bricks per cu. ft.	7.66	4.29	3.43	6.27	3.20	4.74	2.56	3.48
Weight of bricks per cu. ft. (lb.)	57.5	48.0	46.4	47.0	44.1	45.5	42.8	58.4
Free downward area per horizontal checker area, in per cent	28.0	48.9	49.3	33.0	52.5	44.0	52.7	33.0
Effective heating surface per cu. ft. (sq. ft.)	5.00	6.15	5.59	4.70	5.56	3.85	4.93	3.59
Sq. ft. of heating surface in 5,544 cu. ft. checker volume	27,720	34,096	30,991	26,057	30,825	21,344	27,332	19,900
Percentage increase in flue area over standard brick	...	75.0	76.0	...	60.0	20.0	...	60.0
Percentage increase in heating surface over standard brick	...	23.0	11.0	...	18.0	28.0	...	47.4

Advances Made In Welding of Aluminum

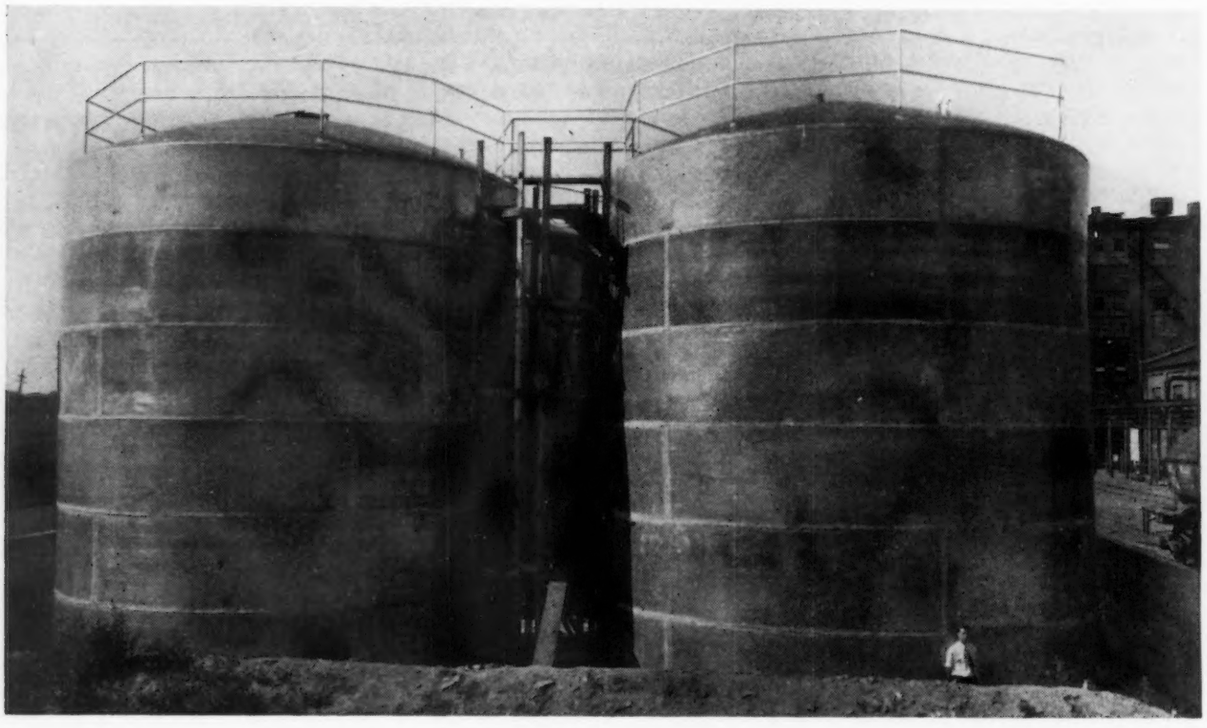
o o o

By G. O. HOGLUND
Supervisor of Welding, Aluminum Co. of America

o o o

ECONOMIES apparent in joining aluminum by electric resistance spot, seam or butt welding have been utilized during 1935 for widely varying industrial applications. Such commercial applications are the result of an earlier equipment development program that is now bearing fruit, and a research program covering the mechanical, fatigue, and corrosion resistance properties of such welds that has provided further knowledge on these significant factors.

Close control of the amount and timing of the current and pressure are essential when spot welding



THESE 30-ft. diameter, 30-ft. high acetic acid storage tanks, the largest aluminum tanks in existence, were assembled by welding.

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SPOT welding the aluminum sidewalk panels for the Covington-Cincinnati bridge.

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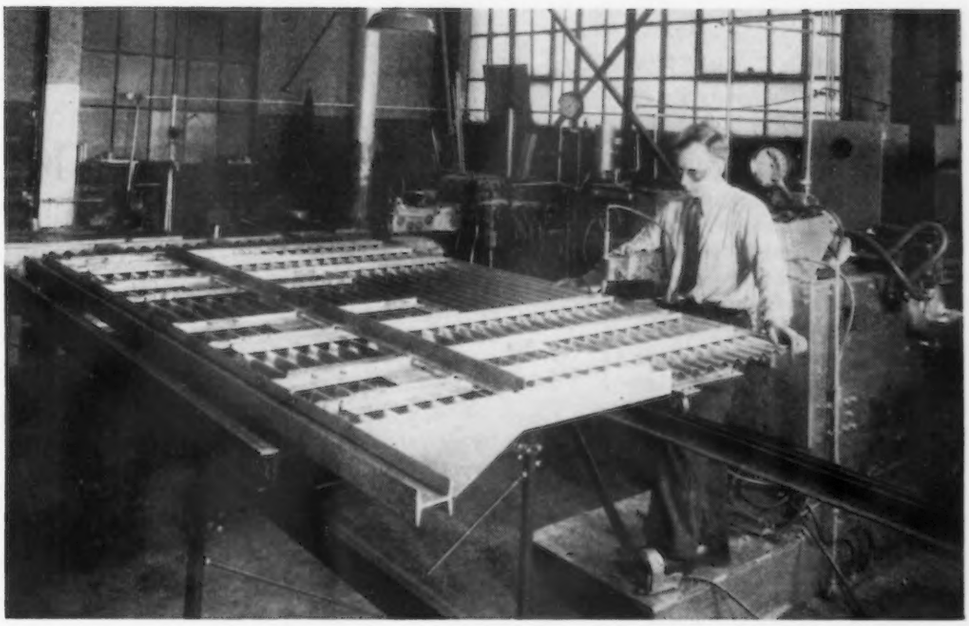


aluminum. Equipment is now available in which these variables are closely controlled for commercial operation. Electronic timing of the current, particularly, is finding wide use where the most consistent results are required. New applications of spot welded construction are found in airplane gasoline tanks, refrigerator evaporator unit doors and fittings, automotive bus tanks and trim, cooking utensils, and dairy and brewery equipment.

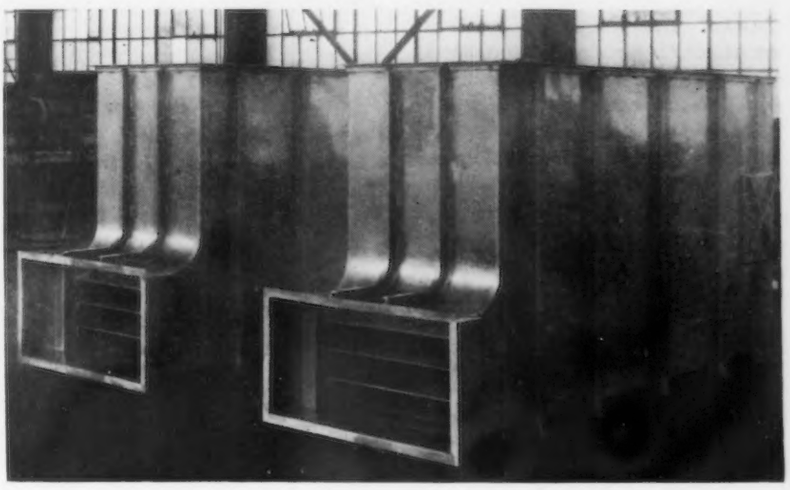
The above remarks on equipment apply as well to seam welding operations, and a number of commercial applications are proving successful. Some of these are hide drying boards for the tanning industry, gasoline tank seams for airplanes and buses, bakery pie and dough tubs, and rubber mat curing trays.

Commercial flash butt welding of aluminum sections was developed in 1935 for use on bicycle rims and automobile window trim. The process has not yet gone into production, but the results obtained are sufficiently promising to establish its potential usefulness.

Arc Welding of Aluminum

Advances in metallic arc welding of aluminum have been chiefly in expanding the field of application of the process. For example, its use has become predominant in assembling aluminum gasoline truck tanks. Minor improvements in the production of welding rod by improving the uniformity of the coating have been accomplished, as well as improvements in shop technique. Increased emphasis has been placed on problems in connection with new applications, with favorable results. Some of these applications are attaching stiffeners and supports for aluminum brewery and dairy tanks, assembly of ship structures, chemical tanks, railroad doors and side panels, and air conditioning ducts.

The oxy-hydrogen torch is still one of the most widely used tools for welding aluminum. Wider use of gas welding has been apparent during 1935, not because of essential improvements in the process, but in connection with the wider use of aluminum alloys. Use of torch welding for air reservoirs and water tanks on the railroads is a typical example. Additional examples are varnish kettles, evaporated milk tanks, and cheese vats. A significant development concerned the assembly of the largest aluminum tanks in existence. These tanks, 30 ft. in diameter by 30 ft. in height, are used for the storage of acetic acid. Contrasted with these tanks are the complicated steam jacketed tanks for making aspirin.



METALLIC arc welded aluminum glass-drying ducts.

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By ELMER C. BRATT
Lehigh University

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Forecasting the Growth o

THE need for forecasting the average growth of industries is often overlooked. Such a forecast of average growth is of value, for only thereby can plant and equipment be produced rationally. The creation of a factory presupposes a need for the type of product the factory will produce for as many subsequent years as the factory will last. No one will question the truth of this principle, but many are inclined to question its practicality until this is clearly pointed out. The building of factories when the current demand for the product of the factory appears to warrant it seems highly reasonable, but the building of factories according to the indication of average growth seems visionary and speculative.

The fact of the matter is, however, that these propositions should be reversed. Within limits, it is reasonable to build factories according to the indications of average growth, and, within limits, it is suicidal to build factories according to the indications of the evanescent current demand at the time of peak prosperity. This can be made clear by means of a purely hypothetical illustration. Assume that, to begin with, there are 500 steel plants with an efficient capacity of 50,000,000 tons of steel ingots per year, and that each additional steel plant built will have an annual capacity of 100,000 tons. Assume that, with allowance for obsolescence and depreciation, the life of a steel plant is 20 years. Also assume that all existing efficient steel plants are used before new steel plants are created. Disregard the piling of inventories. By applying these assumptions and by postulating hypothetical demand for steel for several years, it is possible to demonstrate the irrationality of building steel plants as need for them is indicated by current demand for steel. The hypothetical illustration is presented in Table I.

This illustration makes no allowance for the time necessary to build a steel plant, allows for depreciation on new plants at the same rate as on old plants, and in other respects is very crude. Nevertheless, it is a roughly correct portrayal of the irrational result obtained by building factories according to the indications of the current demand for the product. In this illustration certain facts are obvious. A slight increase in the demand for steel may result in a tremendous increase in the indicated demand for steel plants. When the demand for steel increased from 40,000,000 tons to 50,000,000 tons between years (1) and (2), the demand for steel plants increased from nothing to 25; and when the demand for steel increased from 50,000,000 tons to 55,000,000 tons between years (2) and (3), the demand for steel plants increased from 25 to 75. But, after all available steel plants are in use, a *slowing down in the increase* in the demand for steel will result in a *decrease* in the demand for steel plants. Between years (3) and (4) the demand for steel continued to increase, but at a rate less than between years (2) and (3). The result is an actual decrease in the demand for steel plants from 75 to 57. Between years (4) and (5), the demand for steel dropped from 58,000,000 tons to 50,000,000 tons, and the demand for steel plants dropped from 57 to a point where the existing supply was excessive.

The important fact brought out by this hypothetical illustration is that if the demand for steel plants depends upon the amount of steel being sold currently, the building of steel plants will show a tremendous fluctuation. People in the steel industry have a double interest in this characteristic result. Not only will the building of steel plants fluctuate much more widely than the demand for steel if the steel plant expansion is geared to the current demand for steel, but the building of all factories will fluctuate much more widely than the demand for factory products if the factory expansion is geared to the current demand for the product of the factory. The hypothetical illustration presented in Table I could be duplicated for any industry. Even the production of durable consumers' goods, such as automobiles or electric refrigerators, will fluctuate much more widely than their use if the demand for the durable goods is geared to the current demand for its use.[1] Note, for instance, the fact that more gasoline was consumed in 1932 than in 1929, while only about a fourth as many automobiles were made.

IN this article, the author brings a scholarly approach to a problem which exists in all industry, but which is particularly interesting to the steel industry because of the impressive capital involved when new plants are erected and new equipment installed. His premises are that building of factories when current demand is sufficiently high to warrant such a move is quite reasonable, whereas building plants according to

A "Prince and Pauper" Industry

Now steel is used to build factories and durable consumers'

[1] The extent of the increase in the variation of the indicated demand for durable goods as compared to the use of the goods is dependent upon the length of life of the product. This has been pointed out by J. M. Clark. See his "Strategic Factors in Business Cycles" (National Bureau of Economic Research, 1934), pp. 33 to 38.

of the Steel Industry

the indication of average growth is visionary and speculative. By means of statistics, equations and graphs Mr. Bratt has prepared a forecast of the magnitude of the steel industry for 1940. He points out, however, that to forecast adequately the growth of the industry some reasonable expectation must first be established as to what the continuance of past growth would produce in the future.

goods. If factories were created at a more even rate, steel would be produced at a more even rate. The principal reason why steel is a "prince and pauper" industry is that factories are built according to the current demand for the product of the factories.

There is only one alternative to building factories according to the indications of the current demand for the product of the factories. This is to build factories according to the normal growth of the need for factories. The need for factories is determined by the amount of the factories' products which can normally be sold during the life of the factories. The need, therefore, is for a forecast of the long-time trend of each industry as far into the future as the average life of factories in the industry.

If factories were built according to a reasonably determined long-time trend of the industry, the building of factories might proceed at as uniform a rate as the production of the product of factories. The result would be that the steel industry would be no more "prince and pauper" than industries making short-lived consumers' goods.

It is not reasonable to expect that we may forecast the long-time trend of industries well enough in the near future that the "prince and pauper" characteristics of the steel industry will entirely disappear. Long-time trend forecasts, however, may be made adequately enough to reduce greatly the difference in variation between the steel industry and the average of all industry. This should be very helpful because the steel industry now loses excessively large amounts in depressions.

The extent to which the excessively wide fluctuation in steel production is reduced depends not alone upon the adequacy of the long-time trend forecast in a capitalistic country, however. Where there are many companies, an over-expansion tends to occur in a period of buoyant optimism because of a tendency for duplication of factories to satisfy the demand. This influence cannot be eliminated if a wholesome competition is to be retained, but it might be minimized if long-time trend forecasts were capably made and interpreted by disinterested organizations and by trade associations.

Long-Time Trend Forecasts

The reader may be convinced of the desirability of rational forecasts of long-time trends, and ready to ask whether it can be done. The possibility of forecasting long-time trends rests upon the fact that we are guided in our ways of doing things by habits, institutions, and established customs. The bulk of the population changes its demands for goods very slowly. To live a contented life, our habits and customary ways of doing things make it necessary for us to have the use of about the same type of goods over a period of years.

Important changes have taken place in our use of goods in the last fifteen years, because new goods have become available, and because our increased efficiency has made it possible for us to produce more goods. Our present standard of living, however, is an outgrowth of the standard of living of 15 years ago, and a careful analysis of the growth of various industries shows that the change in demand is the outgrowth of logical factors principally present 15 years ago. This appears to be due not only to the relative fixity of demands based on habits and customary ways of doing things, but also upon the fact that inventions, which increase our ability to produce goods and which make new types of goods possible, depend principally upon general social culture and scientific development.

Logical as long-time trend forecasting appears when presented in this light, it may at first appear anomalous to suggest the possibility of such forecasting when we know that our ability to forecast short-time changes is such as to produce little better than a chance result. Can it be that it is simpler to forecast conditions 10 to 15 years hence than it is to forecast conditions a few months hence? It can, and is, if what we are trying to forecast a few months hence is the actual level of conditions, and if what we are trying to forecast 10 to 15 years hence is the normal level of conditions. The actual level of conditions at most times is highly artificial in the sense that we are usually living off of the production of the past, or we are producing an excess of goods for the future. The principal way in which this takes place is not in the storing and depletion of inventories, but in the creation and use of durable goods.

In depressions we produce goods principally with factories which were built in preceding prosperities, and in prosperity we produce durable goods at a more rapid rate than is warranted by the demand. How long can we continue to live off of factories already built? Not forever, but the precise time we will quit depends upon a multitude of temporary superficial conditions. And the same can be said with re-

Table I—Hypothetical Illustration of the Derived Demand for Steel Plants

Year	Assumed Demand for Steel (Millions of Tons)	Assumed Steel Plants in Use	Steel Plants to be Replaced	Other New Steel Plants Needed	Total New Steel Plants Needed
1	40	400	Unknown	None	None
2	50	500	25	None	25
3	55	550	25	50	75
4	58	580	27	30	57
5	50	500	29	—80	—51

gard to how long we can build factories in excess of current use.

If we are concerned only with the level where production and consumption balance, all things considered (depreciation, obsolescence, repairs, replacements, inventories), we can confidently expect to forecast conditions not only a few months hence, but for several years hence. At balanced levels production depends upon logical, rather than upon superficial, factors. A forecast of the balanced level of industry will not be a forecast of actual conditions, but a forecast of the level around which actual conditions will revolve. It is not a forecast of the actual level of any given month or year which is needed when we are considering the building of new factories, but a forecast of the average level which can be expected.

The forecasting of long-time trends has made but little progress because its accomplishment has been expected by too pompous a method. It is customary to say that we could forecast the long-time trend of any industry if we could establish its law of growth. Ordinarily it is impossible to establish the law of growth of any industry, and therefore it has been concluded that long-time trend forecasting is impossible.

This conclusion, however, is a mistake. A reasonable forecast of the long-time trend of many industries can be accomplished (1) by carefully establishing the equations which best state the industry's growth, and (2) by ascertaining the extent to which we should modify the projected growth shown by these equations because of the shifting influence of factors determining the growth of the industry. In the remainder of this article the first of these procedures is applied to the steel industry.

Steel Growth Considered

The writer has established the fact that the growth of the steel industry is best represented by the American Iron and Steel Institute's series on total rolled iron and steel production, and the fact that the

Table II—Trends Fitted to the Total Rolled Iron and Steel Products Series
Unit = 1 million long tons

	Type of Equation	Trend Equation Y=or, * Log. Y=	Origin	Period Covered	Extrapolated Ordinate for 1940
(1)	Geometric moving averages				
(2)	Gompertz	$*3.7826+(-4.2116)\ (-0.003885)^x$	1854	1854 to 1931	67.2
(3)	Gompertz	$*3.1051+(-3.5586)\ (-0.004908)^x$	1854	1854 to 1932	57.4
(4)	Logistic[a]	$56.057/[1+10^{(2.19037-0.032975x)}]$	1854	1854 to 1932	47.2
(5)	Logistic[a]	$74.784/[1+10^{(2.14645-0.028915x)}]$	1854	1854 to 1932	51.0
(6)	Logistic[a]	$42.108/[1+10^{(2.05053-0.0264464x)}]$	1854	1854 to 1932	38.8
(7)	Parabola[b]	$23.62+0.881x+0.00884x^2$	1914	1899 to 1929	51.3
(8)	Straight Line	$23.52+0.881x$	1914	1899 to 1929	46.4
(9)	Parabola[b]	$21.10+0.851x+0.02015x^2$	1914	1899 to 1929[c]	56.8
(10)	Straight Line	$22.83+0.871x$	1914	1899 to 1929[c]	43.1
(11)	Parabola[b]	$*1.3694+0.01798x-0.000394x^2$	1914	1899 to 1929	37.2
(12)	Parabola[b]	$*1.3471+0.01763x-0.000258x^2$	1914	1899 to 1929[c]	42.8
(13)	Parabola[b]	$20.93+0.844x-0.00206x^2$	1911	1899 to 1923	43.6
(14)	Straight Line	$20.82+0.844x$	1911	1899 to 1923	45.4
(15)	Parabola[b]	$20.60+0.7408x-0.01300x^2$	1911	1899 to 1923[c]	31.2
(16)	Straight Line	$19.87+0.7352x$	1911	1899 to 1923[c]	41.2
(17)	Parabola[b]	$18.29+0.996x-0.895x^2$	1906	1899 to 1913	negative
(18)	Straight Line	$16.6+0.996x$	1906	1899 to 1913	52.5
(19)	Parabola[b]	$19.93+0.794x-0.08007x^2$	1909	1904 to 1914	negative
(18)	Straight Line	$18.93+0.794x$	1909	1904 to 1914	43.5
(21)	Parabola[b]	$26.8+0.871x+0.00554x^2$	1918	1907 to 1929	48.6
(22)	Straight Line	$27.03+0.871x$	1918	1907 to 1929	46.2
(23)	Parabola[b]	$24.24+0.901x+0.03707x^2$	1918	1907 to 1929[c]	62.0
(24)	Straight Line	$26.11+0.895x$	1918	1907 to 1929[c]	45.8
(25)	Parabola[b]	$26.00+0.759x-0.0711x^2$	1915	1907 to 1923	00.5
(26)	Straight Line	$24.59+0.759x$	1915	1907 to 1923	43.3
(27)	Parabola[b]	$23.18+0.633x-0.01134x^2$	1915	1907 to 1923[c]	31.9
(28)	Straight Line	$22.86+0.645x$	1915	1907 to 1923[c]	39.0

[a] These logistics were fitted by the method of selected points, their differences depending upon the three points selected as normal. The equation of the logistic is usually written with the use of the logarithmic base e, but the same results are obtained by the method of selected points when the base 10 is used.
[b] All parabolas in this table are second-degree parabolas, or are properly called second-degree potential equations.
[c] For the periods marked with this footnote, the years 1916, 1917, and 1918 were eliminated in the computation.

data during the twentieth century are most representative of the growth now taking place.[2] It remains to derive the equations most representative of this growth, so that figures may be projected into the future to form a basis for a forecast of growth.

We cannot derive the equation of growth by fitting merely one trend equation. Such a procedure would presuppose that we knew the law of growth and had incorporated it in an equation. The results obtained in measuring the equation of growth will depend upon the equation chosen. Therefore, if we wish to know all of the possibilities, we must fit a reasonable range of equations.

The results obtained in measuring the equations will depend also upon the period of time to which the equations are fitted.[3] Trend-line measurements, fitted by means of a wide range of equations to a wide range of periods, are presented in Table II, and the more important of these trend lines are plotted against the actual figures in Figs. 1 and 2.

There is a statistical adage stating that all of the data form evidence regarding the normal level, and this is true, with few exceptions. Production of steel during the World War years is an exception, however. Production of steel for peace-time uses during the war was most certainly below normal levels, while actual production was far above normal levels. Most of the steel produced was consumed for war purposes, which has no more relation to peace-time needs than if it had been the product of another industry. It is for this reason that 9 out of the 28 trends presented in Table II were fitted with the war years eliminated.[4]

The period 1899 to 1923 begins with a time when the industry was growing at an artificially rapid rate and ends with the relatively low level of production in the early post-war years. The downward concavity of the trend fitted to this period is therefore artificial. The curvilinear trend fitted to 1907 to 1929 has an artificial upward concavity due to the great weight

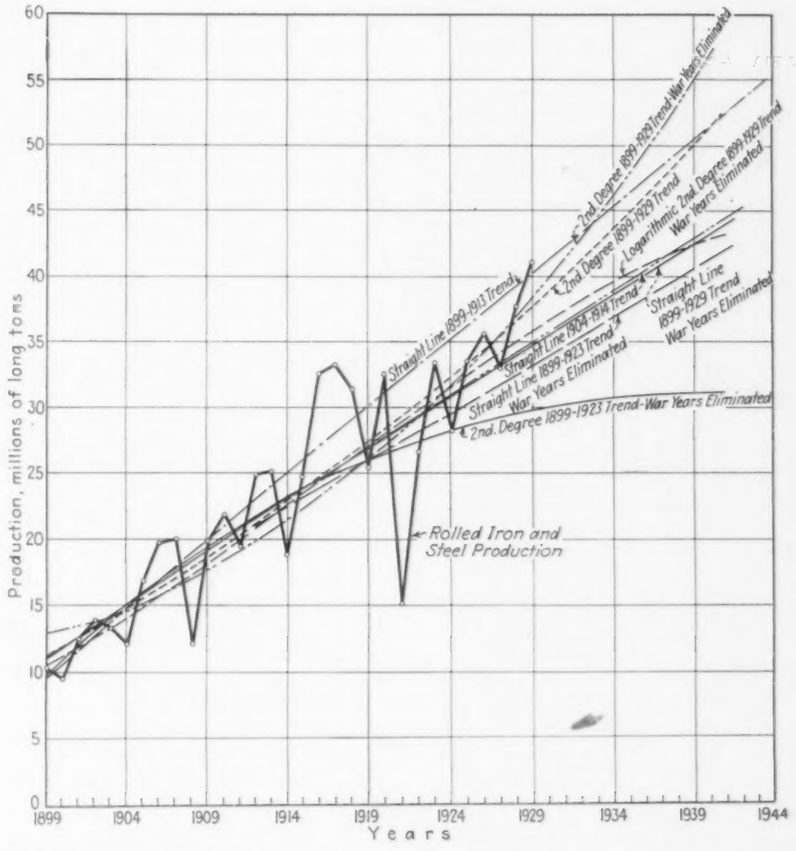
Production, millions of long tons
Years
Straight Line 1899-1913 Trend
2nd. Degree 1899-1929 Trend-War Years Eliminated
2nd. Degree 1899-1929 Trend
Logarithmic 2nd. Degree 1899-1929 Trend War Years Eliminated
Straight Line 1904-1914 Trend
Straight Line 1899-1923 Trend
Straight Line 1899-1929 Trend War Years Eliminated
Straight Line 1899-1923 Trend War Years Eliminated
2nd. Degree 1899-1923 Trend-War Years Eliminated
Rolled Iron and Steel Production

FIG. 1—Trends fitted to rolled iron and steel production. Using data for various periods since 1899. (W.Y.E. signifies "war years eliminated" in the calculation.) Note that most fitted lines begin and end with prosperity. These curves are plotted from data shown in Table II.

Comparisons of the results obtained by using the various periods indicates that the 1899 to 1929 period best represents the growth of the industry. The pre-war periods 1899 to 1913 and 1904 to 1914 are too far remote from the present to give any clear indication of the growth at the present time. The curvilinear trends fitted to these periods bend markedly downward due to the rapid growth in the early part of the century. The rapid growth in the early part of the century is related to the exceptional increase in new users of steel occurring at that time.

thrown on the increases in the 'twenties. The curvilinear trend fitted to 1907 to 1923 has a downward concavity producing a projection considerably under that obtained by use of the 1899 to 1929 figures, but the period is too short to place much emphasis upon its indication.

The period 1899 to 1929 begins and ends with eras during which the expansion of the uses of steel was proceeding at a rapid rate. The influences of these two eras tend to cancel each other in obtaining the slope and curvilinearity of the long-time trend. This is a

[2] See THE IRON AGE, Vol. 136, Nov. 14, 1935.

[3] Most of the fitted trend lines begin with a prosperity and end with a prosperity. It is easy to see that a trend line fitted to a period beginning with a prosperity and ending with a depression will show a growth slower than that which actually took place, and that a trend line fitted to a period beginning with a depression and ending with a prosperity will show a growth more rapid than that which actually took place. It is further true that the most satisfactory period for fitting a trend line is one beginning with a prosperity and ending with a prosperity. Use of depressions as end points is ordinarily unsatisfactory because depressions vary greatly in their relative violence. Prosperities vary some in their relative violence, but not nearly to the extent true of depressions. Beginning and ending with a normal position ordinarily is less satisfactory than beginning and ending with a prosperity position, since we must have the trend measurement to determine what is a normal position.

[4] The years 1916, 1917, and 1918 were eliminated for the nine trends indicated. This was accomplished by omitting the rows for these years in adding the columns of the computation tables. It may be argued that wars occur recurrently, and that they therefore represent a part of the normal growth. Wars may very likely redistribute the periods of steel consumption, as occurred, for instance, in connection with the building deficit which grew up during the World War. However it is difficult to see how the consumption of steel for war purposes greatly affects the long-period growth of peace-time needs.

highly empirical method of obtaining such an adjustment. It may be that the artificiality of the expansion of uses was greater in the early part of the century than in the 'twenties decade, but if so the result will be a too conservative statement of the future trend level.

The curvilinear trend fitted to the period 1899 to 1929 has a very definite upward concavity. With the war years eliminated the ordinate of the second-degree parabola (a curvilinear trend which assumes a constant concavity) is 56,800,000 tons for 1940, while the straight line gives a 1940 ordinate of 43,100,000 tons. It is clear that the normal level for 1940, as indicated by past data, falls between 43,000,000 and 57,000,000 tons of rolled iron and steel.[5]

The second-degree parabola fitted to the logarithms of the data for the period 1899 to 1929 gives a 1940 ordinate of 42,800,000 tons, a figure very nearly equal to the indication given by the straight line fitted to the absolute data. The curvilinear trend of relative rates, however, shows an unrealistic decline if produced very far into the future. The greater consistency in the growth of the amounts than of relative rates is indicated by the fact that the straight line fitted to amounts gives a fairly consistent 1940 ordinate almost regardless of the period to which it is fitted. The straight line fitted to the 1904 to 1914, 1899 to 1929, 1899 to 1923, 1907 to 1929, and 1907 to 1923 periods give respectively the following 1940 extrapolations, stated in million tons: 43.5, 43.1, 41.2, 45.8, and 39.0. Nowhere near this consistency would be found in fitting straight lines or any other fixed equation type to the logarithms of the data.

The reader's patience may be somewhat tried by the fact that none of the trend lines are fitted to periods ending at a more recent date than 1929. Such a trend fitting cannot be satisfactorily accomplished, however. We must remember that to avoid the grossest artificiality, it is necessary to have the period used for fitting begin and end in similar phases of the cycle. But there is no earlier depression of the twentieth century of comparable length and severity. This does not mean that we should disregard an analysis of the effect the present depression may have had on normal levels in the industry. Neither should we disregard the fact that the quality of steel is changing, nor many other factors which must be considered determinants of the growth of the steel industry. The analysis of the factors determining growth, however, is beyond the province of this article. An adequate forecast of the growth of the steel industry must first establish some reasonable expectation as to what a simple continuance of past growth would produce in the future. Then, it is necessary to examine each determining factor and ascertain the extent to which it is to be expected that the determining factor will modify the growth.

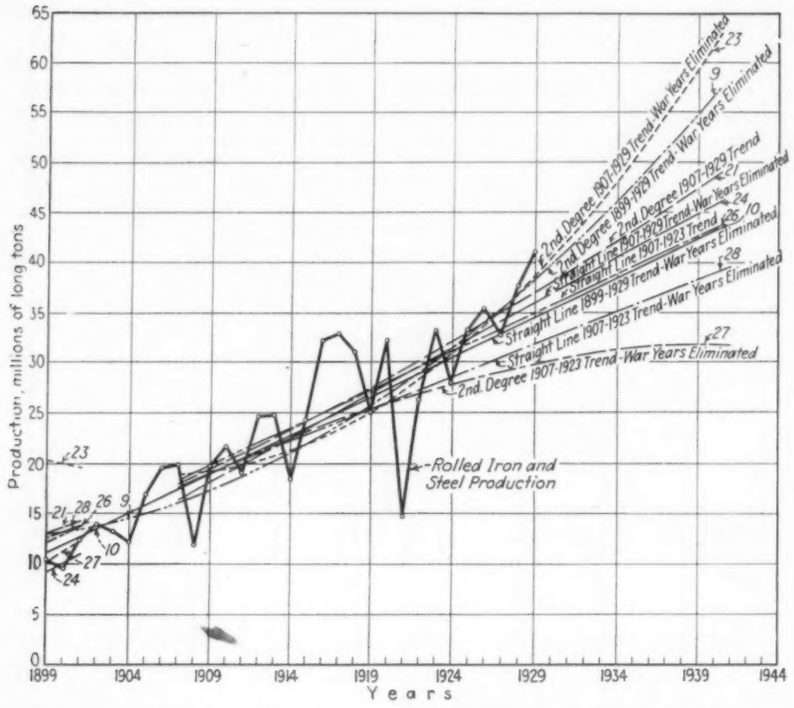
Production, millions of long tons
Years
Rolled Iron and Steel Production
2nd Degree 1907-1929 Trend War Years Eliminated
2nd Degree 1899-1929 Trend War Years Eliminated
2nd Degree 1907-1929 Trend
Straight Line 1907-1929 Trend War Years Eliminated
Straight Line 1907-1923 Trend
Straight Line 1899-1929 Trend War Years Eliminated
Straight Line 1907-1923 Trend War Years Eliminated
2nd Degree 1907-1923 Trend War Years Eliminated

FIG. 2—Trends fitted to rolled iron and steel production. Using data for various periods since 1899. (W.Y.E. signifies "war years eliminated" in the calculation.) Note that the uses of steel were proceeding at a rapid rate at both the beginning and end of the period 1899 to 1929. These curves are plotted from data shown in Table II.

[5] Since the American Iron and Steel Institute series fails by about 6 or 7 per cent to cover all iron and steel products, these figures should be raised by about this percentage if a total of all iron and steel products is being considered. See "How Can the Growth of the Steel Industry Be Measured?" THE IRON AGE, Nov. 14, 1935.

The Carnegie-Illinois Steel Corpn. has added Buffalo and the western half of New York to its Cleveland sales territory and the Buffalo office will hereafter be under the direction of F. C. Hardie, Cleveland district sales manager, with W. S. Sayler as assistant manager, the latter being located in Buffalo in charge of the office. The New York territory that will come under the Cleveland sales office will include the part of the State extending as far East as the eastern lines of Cayuga, Tompkins and Tioga counties.

Allegheny Steel Co., Brackenridge, Pa., has just completed production and shipment of what is believed to be the largest polished stainless steel sheet yet produced. Each of these Allegheny metal sheets, 15 in all, is slightly over 208 in. long, 72 in. wide, 3/16 in. thick, and weighs approximately 810 lb. These sheets were furnished with a bright smooth finish and are used in the textile industry in forming the bottom of dye kettles through which articles being dyed are conveyed. The sheets were part of an order for 45,000 lb. of stainless steel received by the company.

A completed Reynolds specified house at 300 Oxford Road, New Rochelle, N. Y., owned by Harold F. Birnbaum and designed by Lee Perry.

Existing Building Facilities Adapted To Prefabricated Construction

° ° °

By ROBERT BINGHAM
The Iron Age, New York

° ° °

A NEW and unusual housing system whereby a completely fireproof dwelling, composed 25 per cent of steel and 75 per cent of other fire-resistant materials, may be constructed at a cost of only 10 to 15 per cent more than that of an ordinary frame structure, has been developed by the Reynolds Corpn., 19 Rector Street, New York, a subsidiary of the Reynolds Metals Co. Not content with the future presented by the prefabricated stock house the Reynolds organization has worked out a plan, the basic feature of which is the use of the present facilities of the building industry; that is, of architect, builder and dealer, each of whose functions remains unimpaired by the use of the new plan.

WITH few limitations in design, size or type of dwelling, the Reynolds system lends itself admirably to nearly every type of construction. The houses are not only all completely individual, but may be fireproofed throughout. The acceptance of this system by builders as well as its efficiency makes it of unusual interest to the metal industry.

Two main policies underlie the activities of the company: First, to offer the most perfectly constructed and equipped housing that American engineering can produce with complete flexibility as to architecture and plan and, second, to simplify the complex procedure that is now required in the building of even the most modest home. The successful merging of these two policies is the goal sought in the Reynolds system house.

To attain that goal, the Reynolds Corpn., believing that the best housing requires the services, each in his specialized field, of architect, builder and dealer, has

coordinated its activities through technical experts in every phase of building by close supervision of specifications and construction and undivided responsibility for all materials.

Choice of Finish Materials

The company has limited itself to the supply of the structure of the house plus its mechanical equipment. It permits choice of all finish materials, such as hardware, lighting fixtures, flooring and wall coverings from any source, feeling that these materials are best selected locally. The company builds no houses itself. Instead, its plan is to aid the building industry in its efforts to meet the constantly changing conditions of modern construction methods and demands by centralizing the sources of supply for building materials and assuming responsibility for all materials used and to combine these materials to provide a well-balanced, properly specified structure.

The idea behind this plan is to provide a qualified organization to guide architects, builders and dealers through the many conflicting claims of building products manufacturers. The Reynolds company compares itself to the modern clinic with specialists in framing, heating, air conditioning, insulation, plumbing, etc., instead of in the various fields of medicine, to assure clients that the materials from their particular departments which are to be used in the systematized houses are the best suited for the structure and are properly installed and planned in relation to the entire building. The company's plan is to select the best results of its technical experts to adapt to the housing plan and thus assure the public of the best available materials, since its interest will be to provide the best possible finished home, rather than to favor certain products.

Materials Offered by Company

The materials which are included in the Reynolds specification service and which are available to anyone subscribing to the plan are:

1. Reynolds flameproof and termite proof framing and structural flooring.

2. Reynolds Ecod fabric plaster base—plain and metallated.

3. Reynolds Metallation (insulation).

4. Reynolds air-conditioning system, complete.

5. Reynolds plumbing system and fixtures, complete.

6. Reynolds steel windows.

7. Reynolds complete flooring.

8. Reynolds liquid Metallation.

When the actual building stage is reached, the client who desires to purchase a house goes to any architect he wishes and has his plans drawn up according to his own ideas—there are no limitations of any sort whatsoever in planning for the house, an absolute flexibility of design being possible. General types of materials desired are specified by the architect and the plans and specifications are then forwarded to the Reynolds Corpn., where the engineers translate the requirements into a fully specified house. Framing plans are made by the framing department, the air-conditioning section plans the proper type unit for the particular design of the house and the plumbing division plans its layout in coordination with the structural conditions imposed by the plan. The plans are then returned to the architect or builder for approval. During progress of the house, Reynolds engineers supplement the activities of the architect and general contractor, but do not replace them.

The builder, too, operates in the usual manner. If building for sale he submits his architect's plans which are interpreted in terms of Reynolds materials and equipment. When the specifications have been agreed upon the dealer is selected who is to handle the material and through whom Reynolds distributes its products. The company offers advertising aid during the construction of the house, arranges special previews and issues engraved invitations to prospective buyer lists and civic officials, arranges a demonstration in the house and organizes a direct mail campaign to exploit the builder's prospects.

Dealers' Part Emphasized

The dealer is equally important in the Reynolds plan as a specialist in his local market. All materials are distributed through the dealer and he receives full commission on all products handled by him. The Reynolds organization regards him as the best judge of local conditions and credit, realizes that he is equipped with warehouse facilities and delivery service and, most important, recognizes in his sales and merchandising ability the creation of a demand for building.

LAYING floor slabs over the joists. The slabs may be moved with great ease. They are now in position to be nailed to the joists.

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To round out and complete its service, the Reynolds Corpn. has organized the Reynolds Fiscal Corpn. which acts in an advisory capacity to owners and builders in obtaining the most satisfactory local financing, and in cases where local facilities are inadequate, makes direct loans. Rates will be in accordance with prevailing interest rates and practices in the local community.

Fireproofing Stressed

All of the materials used in the construction of Reynolds houses are fireproof. Floor joists, which are designed and tested by engineers to assure sufficient strength for all loads to which they may be subjected, are built up of steel

cover plates, wide flanges and web centers. Flange and cover plates are crimped and filled with a fireproof filling mixture which enables the joists to be handled exactly the same as in timber construction, since they constitute nailing members by virtue of the composition of the mixture. Studs are of the same general construction as the joists, rolled from sheet steel, and measuring 1¾ in. in width and 4½ in. in depth. They, also, are nailing members. Joists and studs are manufactured in sizes which permit flexibility of design and dimensions. The Reynolds system tries to make no problem of satisfying special preferences on the part of the architect or builder.

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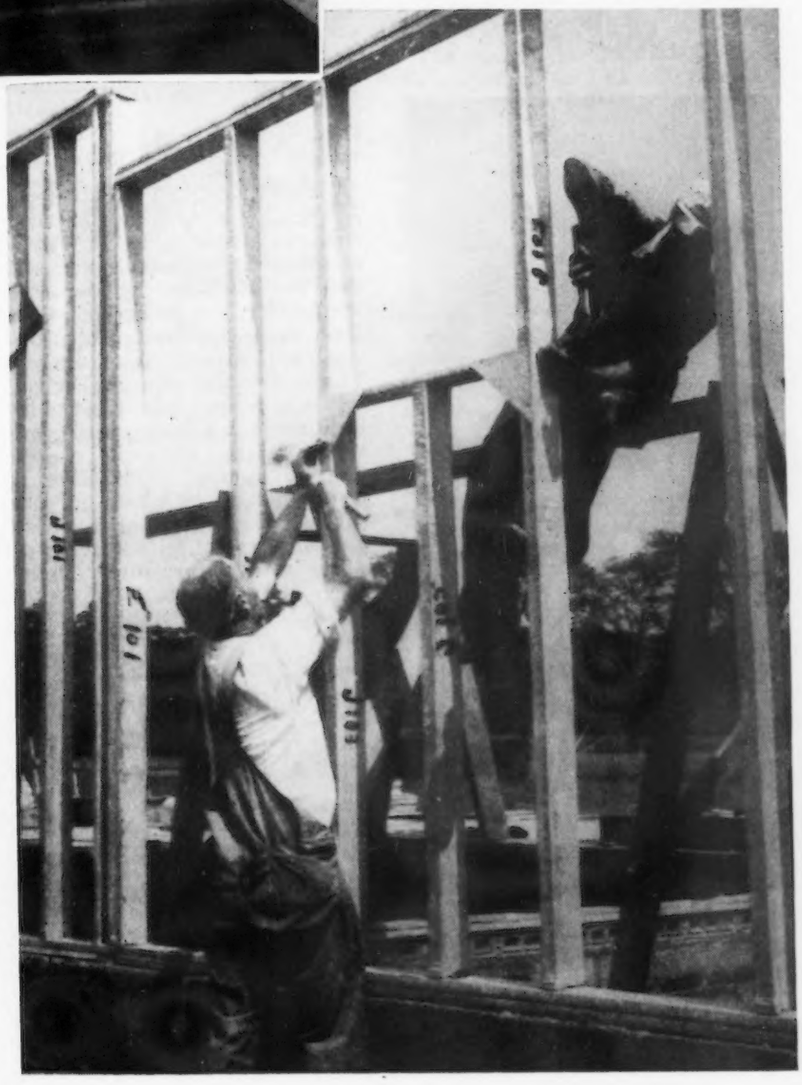
CARPENTERS erecting Reynolds Metalumber framing in the regular wood-framing manner.



Floor slabs are of a specially prepared pre-cast compound, 1¼ in. thick, 15½ in. wide and 4 ft. long. They are reinforced with Reynolds Ecod fabric and additional stud bars and are sufficiently light to enable one man to carry two slabs on the job.

Construction is carried on exactly as if wood were being used in the framing. Carpenters, after experience in erecting one house made of specified materials, find that less time and less trouble are necessary when working on additional houses of this type. Sills are laid directly on foundations to conform to whatever exterior finish is to be used—brick veneer, stucco, etc. Floor joists are placed on the sills, 2 ft. on centers, bridged every 8 ft. with a steel band 2 in. wide. Longest span is 18 ft. Floor slabs are laid directly on the joists with the 4-ft. ship lap dimension at right angles to the joints. The outside framing consists of a series of standard studs and window bucks placed on 16-in. or 2-ft. centers. When the first floor is finished the second floor framing is completed, followed by wall framing for the second floor.

Reynolds roofing consists of 4½-in. roofing members used for the rafters placed on 16-in. centers, with 2 x 4 members for bracing.

Air Conditioning Provided For

Interior partitions are framed with regular Reynolds studs placed 15 in. or 24 in. on centers, secured by a shoe on the floor and a plate on the top of the same dimension. When the main chassis is completed, partitions are set for the division of space, installing the necessary materials required for the application of the fabric plaster base, ducts, etc. When air-conditioning ducts are to be run through the partitions, plates are cut out to admit passage of the ducts, and tied together with structural angles nailed at the side in the usual manner. Plumbing is installed in the same manner as in wood construction.

Electric wiring is of the cable or conduit type strung between the webs of the joists. Holes are punched in the walls through the center of the studs to admit passage.

When all mechanical equipment is installed, the Reynolds Ecod plaster base is applied. Ecod lath

(CONCLUDED ON PAGE 104)

Improvements in Production

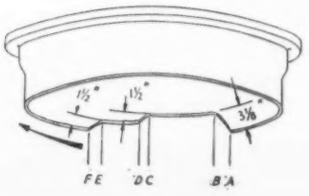
Multiple Spindle Drilling Machine Utilized for Piston Balancing

A TWELVE-SPINDLE vertical drilling machine, designed by Davis & Thompson Co., Milwaukee, is here illustrated in a set-up for balancing pistons. The pistons come to the machine ground to size and bored for the piston pin. Requirements are accuracy to within one gram of weight.

In this particular set-up stock removal is 0.015 in. for each gram of weight. Measurements are automatic from the top or skirt end of the piston. The operating cam is stationary. "A," in the insert, is the finishing end of the cam.

The setting of each spindle involves the finishing position where, in setting, the cutters are positioned to just touch the piston top. The spindle is then brought to the second position, where an indicator is set for the removal of a sufficient amount of stock, during the machine revolution, to reduce the overweight. The individual spindle setting is then complete for use until the cutter becomes dull and requires replacement. Inasmuch as this particular set-up involves the removal of 0.015 in. of stock for each gram of weight, it is obvious that should a piston be two grams heavy the indicator must register 0.030 in. for removal.

The arrow in the insert shows the direction of machine rotation, which is controlled by a lever-operated clutch. The cycle of operations is as follows: When the roller gets to the cam-point "A," the piston is finished and the spindle automatically returns to the point "B." This is the operator's stationary position where he loads and unloads as the spindle travels from "B" to "C." While traveling from "D" to "E," the spindle is set for depth of cut, according to the indicator; the setting can be for the removal of any required amount. The spindle then travels from "E" to "F," where the cut begins, providing a full ⅛ in. is to be removed. If lesser amounts are to be removed, the cutting begins at a later position in the machine rotation; just which succeeding position is automatically determined by the proportionate amount of stock to be removed to insure that the piston will be in finished condition when it reaches the point "A."



THE cam, in the layout shown above, is stationary and its position on the machine is directly in back of the series of handwheels above the gages.

Pick-off gears provide spindle speeds from 50 to 750 r.p.m. Spindles have push-button control. Each individual table is adjustable up and down within a maximum distance of 26 in. between table and spindle nose. Spindle feed is automatic. Standard equipment includes a chip conveyor mechanism. The machine is powered with a 25-hp. motor, at 1150 r.p.m. Weight is approximately 21,000 lb.

Ratchet Diestocks Eliminate Bushings

A THREE-POINT self-centering guide, eliminating bushings, features a new series of ratchet diestocks for adjustable and solid dies manufactured by the Armstrong Mfg. Co., Bridgeport, Conn. Both single and multiple die holdings are included in the series. Thumb pressure on a pawl trigger serves to reverse from right to left hand through three operating provisions—right, left and neutral. The die member is locked or released by a finger movement without accessory equipment. Kalorized die leads provide for threading advance without pressure. Thread range is from ⅛ to 1 in., and ½ to 2 in.

New Electric Motors One-Half to 200 Hp.

THE Imperial Electric Co., Akron, Ohio, has announced a complete line of splash-proof, squirrel-cage motors in all ratings from ½ to 200 hp. for constant and multi-speed, continuous or intermittent duty in all voltages and cycles, for any torque and starting current. Air intake is by small openings in the bottom of end brackets; louvres in the frame cover, underneath the motor, provide air exit.

and Shop Equipment . . .

Horizontal Single and Double-End Curling Machines of New Design

HORIZONTAL double and single-end machines for curling the ends of round tanks over the end stampings, either one or both ends, in a single operation, have been placed on the market by the Peck, Stow & Wilcox Co., Southington, Conn. Capacity is for tanks 12 to 18 in. in diameter, up to No. 14 gage Monel metal.

The machine has a stationary headstock and an adjustable tailstock. Curling chucks are mounted on the head and tailstocks of the double-end machine, but on the headstock only of the single-end model. Both chucks are driven from each end of the machine by silent chain from a driveshaft, which is driven, in turn, by a 7½-hp. motor and silent chain. A hand-operated clutch controls the driveshaft.

Tanks are placed in position between the two revolving chucks that carry the curling rolls and are held stationary by quick-acting clamps. On the double-end machine these clamps are not fixed to the bed, permitting the tanks to float laterally during the curling operation.

Each curling chuck carries three curling roll holders provided with screw adjustment for tanks of various diameters. The tailstock is adjustable by handwheel for tanks of various heights or lengths. The headstock curling chuck is moved into action by means of a handwheel, but this can also be accomplished by a power attachment if desired. Headstock movement of 4 in. is provided.

The curling rolls naturally leave the curled edges rounded with a space between the end of the upturned flanges of the end stampings and the inside of the curled-over edges of the cylinders. To eliminate this space, three adjustable flattening rolls can be applied between the curling rolls, as shown in the illustration. These flattening rolls can be brought into action immediately after the curling is completed, by depressing a foot treadle. Both curling and flattening of the ends are done in one operation without stopping or adjusting of the chucks.

Except for the curling chucks, the machine is mainly of welded steel construction. The double-end model weighs about 5000 lb., and the single-end machine about 4000 lb. Anti-friction bearings are provided for all rollers. The driveshaft is mounted on Timken roller bearings, and bearings for chuck spindles are bronze bushed. Thrust loads are absorbed by ball thrust bearings. Alemite lubrication is provided throughout; the headstock mechanism operates in a bath of oil.

Both double and single-end machines for Monel metal hot water tanks 12 to 18 in. in diameter and up to 66 in. in height are in service. Actual time required per tank is said to be about 30 sec. on the double-end unit. The machine described can be modified for other uses, such as false wiring operations, inside or outside, on round cylinders or open-end tanks.

The Bradley Washfountain Co., Milwaukee, has added to its line of group washing equipment for industrial use. The additions include 36-in. circular and 54-in. semi-circular units accommodating six users at one time and having either hand or foot control of water flow. Bowls are solid one-piece pressings, finished in acid-resisting vitreous enamel. Pressed iron pedestal base members are welded to cylindrical superstructures and finished in synthetic enamel.

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Double-end machine for curling tank ends over the end stampings. Flattening rolls can be applied between the curling rolls, as shown. Both types of roll are adjustable.

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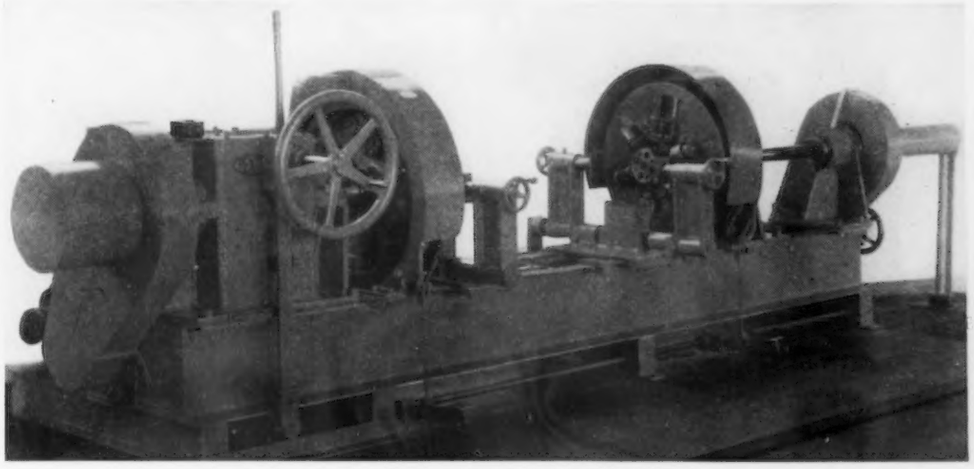


Machine for Variable Internal Tooth Crowning

THE utilization of internal gear drives for motor cars calls for close finish limits for internal gears. To obtain this condition, where the gears are in constant mesh and run at high speeds, the National Broach & Machine Co., Detroit, announces a gear tooth crowning machine said to be effective in preventing small planet gears from bearing heavily on their edges under different conditions of torque on the main drive.

It is provided that the teeth may be automatically crowned to any desired amount, preferably enough to offset possible misalinement of shafts.

Patented crossed axes shaving, as used in many transmission plants, has been applied to shaving of the profiles on internal gears subjected to this method of crowning, as illustrated in the insert. The chordal thickness of the teeth at the ends varies from the middle by 0.001 in.

Production rate is approximately 30 gears per hr., and tool finish is said to be sufficiently smooth to avoid necessity for additional finishing operations, such as burnishing; this avoids the compression of material which will rebound in the heat treatment. The operation of the machine is automatic in performing its cycles of feed, cut and crowning; in eliminating eccentricity and index error, and in correcting error to master gear approximation.

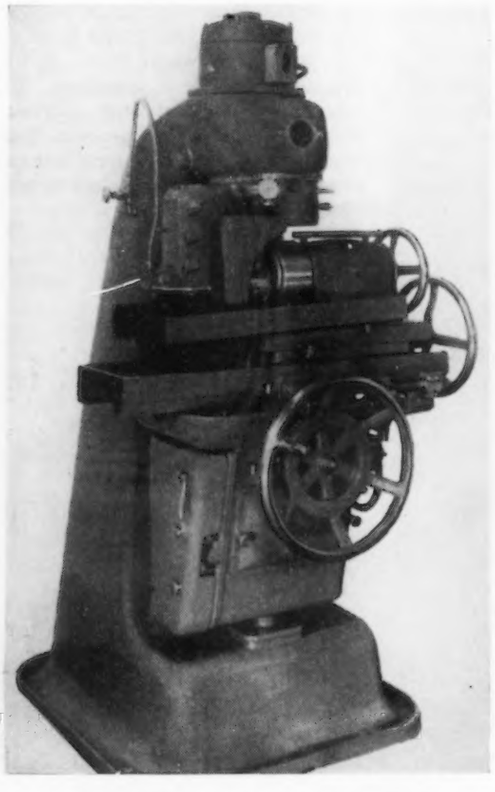
Rugged construction provides that under the light tool loads required, there is no measurable spring. Chips are hair-like in size and resemble mineral wool. Cutting practice corresponds in effect with single-point turning or diamond boring.

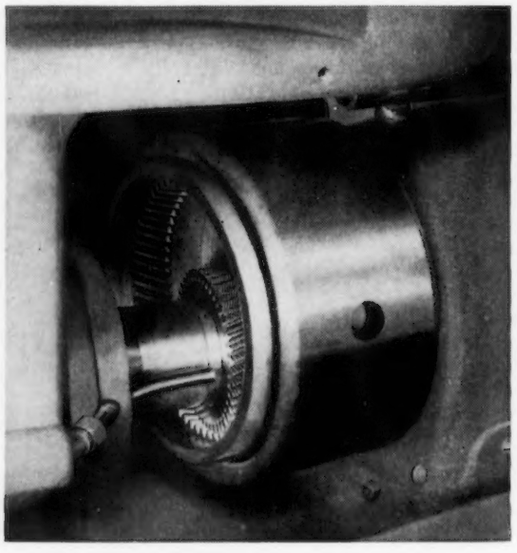
Die Casting Machine For Brass Alloys

IN a brass die casting machine by Reed-Prentice Corpn., Worcester, Mass., operating oil pressure of 2000 lb. is said to give an excess of required pressure against metal in the die casting of brass alloys. The machine is fully hydraulic and is operated by two levers with controls interlocked to prevent plunger operation unless dies are closed. A safety pilot valve mechanism guards against any metal feed while dies are open. Automatic ejection of castings is provided for and die plates are finished on four sides for core-pulling attachments. Two sizes are available, 2-G and 8-G. Die plates are 32 x 37 in. and 39 x 42 in. respectively.

Larger Capacity for Cut-Off Machine Line

INCREASED capacity for its line of cutting-off equipment involves a new 4½-in. machine by the Modern Machine Tool Co., Jackson, Mich. Double, cam actuated tool slides, each with an independent screw adjustment, provide that both slides may be used simultaneously in cutting off, or a special cam may be placed on the back slide to permit of using a chamfering or turning tool in that position. The spindle is carried on a large Timken roller bearing. A cone and adjusting nut for operating the collet are placed between spindle bearings. The drive pulley is in back of these at the end of the spindle; the motor is mounted below and drives by V-belt. Live roller feed is operated by a collet control lever which opens the collet and brings the feed rolls up to the stock. It is said that in operating, the hands need not be removed from the levers. The machine is of welded base construction and weighs approximately 2540 lb.





CROSSED axes crown shaving of tooth profiles of internal gears at a production speed of 30 gears per hour is accomplished without requirement for a burnishing operation on the finished gear.

Straight-Line Polisher With 14 Heads Gives High Output on Auto Hub Caps

A CONVEYOR-TYPE continuous polishing and buffing machine made up of 14 individually driven wheel-heads, under which the work is carried intermittently by an indexing chain conveyor having 38 work-holding fixtures, has been built by the Packer Machine Co., Meriden, Conn.

The first of these machines was designed for finishing automobile hub caps. Successive operations include polishing under a series of emery-coated wheels, then buffing to a mirror finish. Compounds having clay, rouge or lime as the chief ingredient are used in the buffing, and each wheel-head that requires it is equipped with an automatic compound feeding device. In addition to the use of different compounds, wheels of various diameters and face width and operating at different speeds and pressures are required in this machine.

The 14 wheel-head units are of the company's standard design. They are mounted on a 42-ft. long welded-steel baseplate, together with the conveyor and chuck rotating drive and other units. Wheel-head drive motors are of induction type and are entirely inclosed and fan-cooled. Each drives its wheel-spindle through a multiple V-belt, variable speeds being obtainable by changing pulleys. Each motor is mounted on an adjustable sliding base, which facilitates both pulley changing and belt tensioning.

Wheel-heads may be adjusted to three positions as regards plane of wheel-rotation, and pressure of the wheel against the work can be varied by simple handwheel adjustment. Furthermore, with its column mounted on a sliding base, the entire wheel-head can be adjusted to or from the work-carrying conveyor.

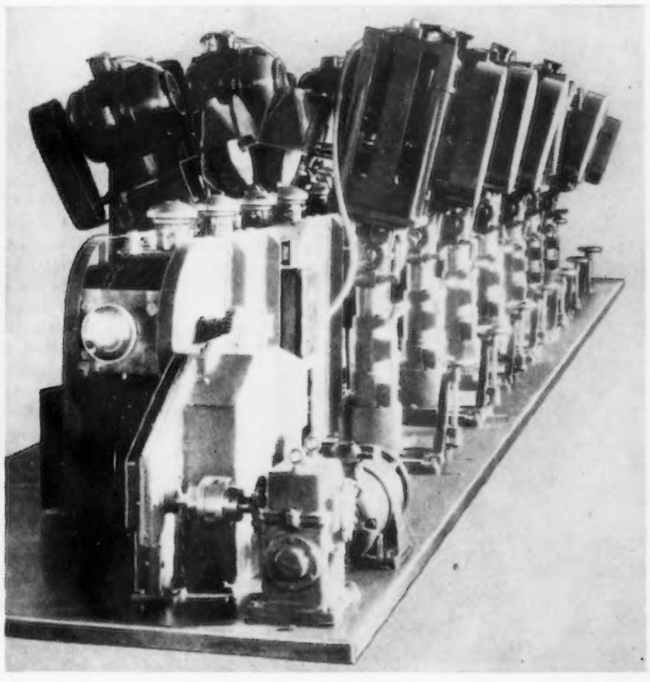
To make for compactness, each succeeding wheel-head unit is located on opposite sides of the work-conveyor, an arrangement that shortens the machine by some 18 ft.

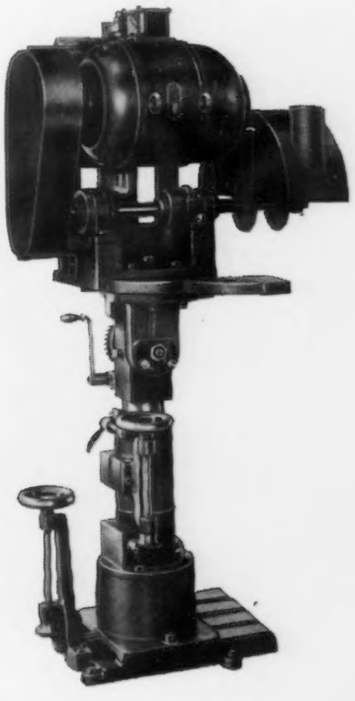
An outstanding new feature is the straight-line indexing mechanism, by means of which the work is not only intermittently conveyed but is accurately held at each station while it is being rotated at uniform speed in contact with the polishing or buffing wheels. Both the rotating speed and the indexing cycle can be varied to suit the work being finished. The work conveyor is actuated by a large Geneva mechanism driven through gearing by a 5-hp. Transitorq motorized variable-speed unit.

Work to be polished is held in expanding chucks mounted on platens on the chain conveyor. Springs clamp the work in the chucks, and the arrangement is such that the springs are released as the platen and chuck arrive at each end of the table, to facilitate loading and unloading the work. Each platen is equipped with guide rollers that support and position the work as it is conveyed from station to station.

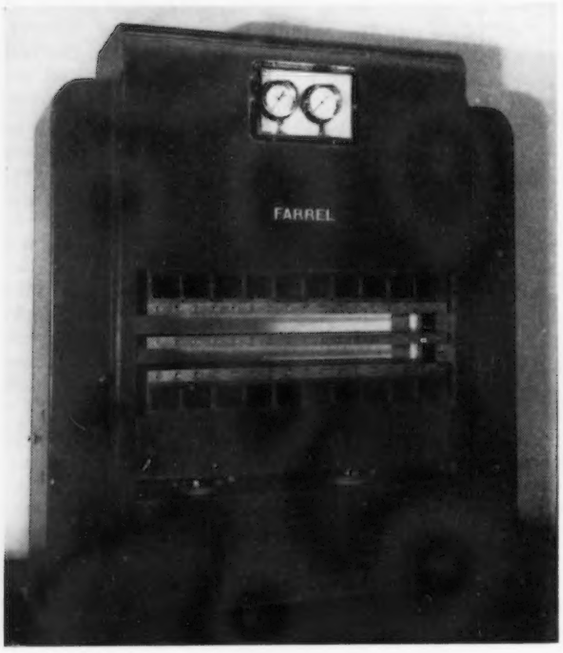
Rotation of the work while in contact with the wheel is accomplished by an arrangement that includes a loop of roller chain extending the length of the table and driven by bevel gears from a separate Transitorq unit rated at 1 hp. This chain meshes with a sprocket keyed to a vertical rotating shaft of each platen.

In designing and building the initial machine delivery within a specified time, as well as a definite high output per hour, had to be met. This was facilitated by the use of standard unit parts and use of welded steel construction where patterns were not available. Machines of the same type may be used for the polishing and buffing of cooking utensils, vacuum cleaner housings and a variety of other parts.





THIRTY-EIGHT holding fixtures are involved in a continuous polishing and buffing assembly of units having provision for extreme flexibility through wide range of individual unit adjustability.

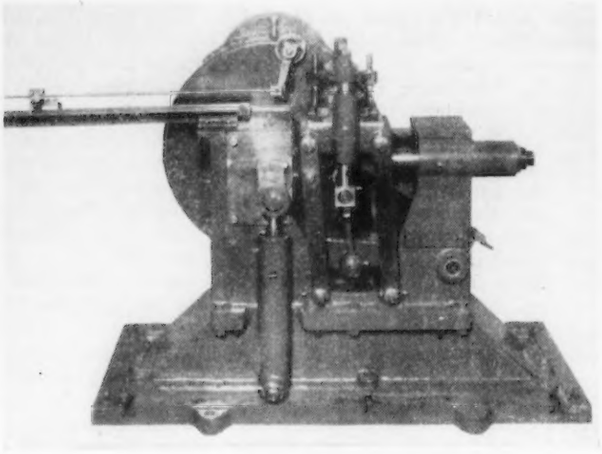


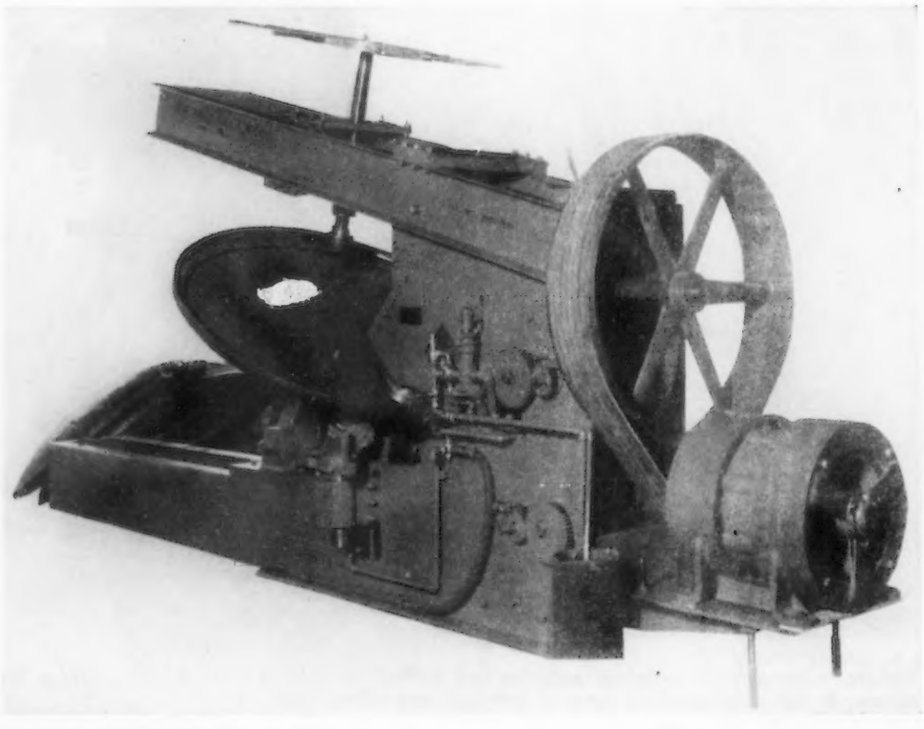
ABOVE

FARREL-BIRMINGHAM CO., INC., Ansonia, Conn., has announced a new member to its fully inclosed line of hydraulic presses for plastics and rubber molding operations. A self-contained power unit uses oil as the fluid medium. The press weighs 140 tons and has platens 60 in. wide by 30 in. deep. The cylinders are integral with the bottom crosshead casting and two 8-in. rams work within them. A pressure of 150 lb. per sq. in. of platen area is provided. Rolled steel slide slabs replace conventional tie rods. One valve only is utilized in operating the press. A pump control handwheel provides maximum pressure adjustment. Cleanlining features external design.

BELOW

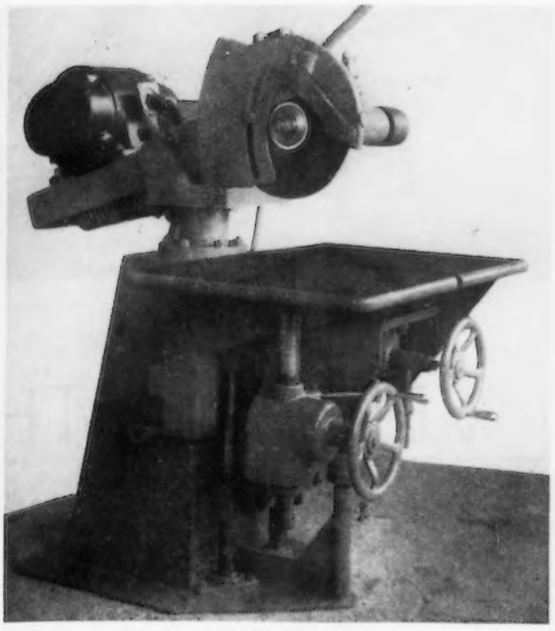
FOR cutting metallic strips to lengths as illustrated in the insert, the Yoder Co., Cleveland, announces an automatic cut-off machine of the flying shear type. A die is mounted on a cam actuated table having the same speed of movement as the section work piece. Length is controlled by a flag switch which when tripped releases the cut-off die mechanism. Applications suggested by the makers are to narrow flat and formed sections and to flat-strip service.





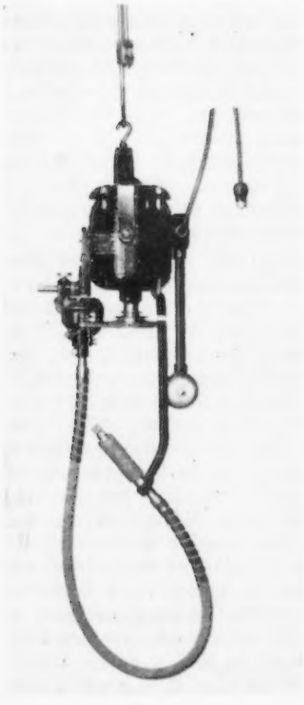
AT LEFT

HIGH-SPEED flanging machines illustrated are built by the Blue Valley Machine & Mfg. Co., Kansas City, Neb. They produce a 2½-in. flange on a 12-ft. diameter, flat head, ¼-in. thick, in one minute. The flanging mechanism is mounted on a main frame. Utility is for boilers and tank heads, either flat, hilged, concave or round. Controls are centralized. Machine operator has unobstructed view of work. Capacities range from 30-gage thickness, 12-in. diameter to ⅝-in. thick, 20-ft. diameter. Linc-Weld motors by Lincoln Electric Co., Cleveland, range from ¾ to 15 hp.



ABOVE

A SPLIT table, with two halves vertically adjustable for work support in abrasive cutting-off operations, features a new machine design by Tabor Mfg. Co., 6225 Tacony Street, Philadelphia. The head is of combination construction which permits that it may be locked in position while work is hand fed to it, or the head can be lever fed, against spring tension, down on to work pieces. The spindle is mounted in heavy-duty, dust proof Timken bearings. A completely guarded multiple belt drive is employed.



ABOVE

A VERTICAL, three-speed flexible shaft equipment by N. A. Strand & Co., 5001 North Lincoln Street, Chicago, is built in capacities of 1/6, 1/4 and 1/3 hp. A three-speed countershaft arranges for quick changeover, in providing 1700 to 10,400 r.p.m.

o o o

AT RIGHT

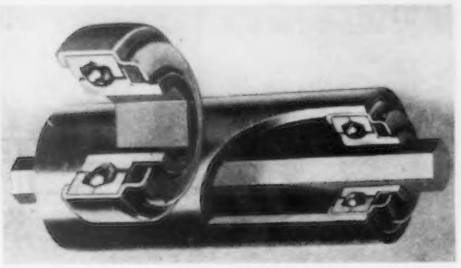
THE 6-in. ram, 50-ton, straightening press built by American Broach & Machine Co., Ann Arbor, Mich., has been installed for straightening automobile front axles. The equipment is operated by a 7½-hp., 1200-r.p.m. motor.

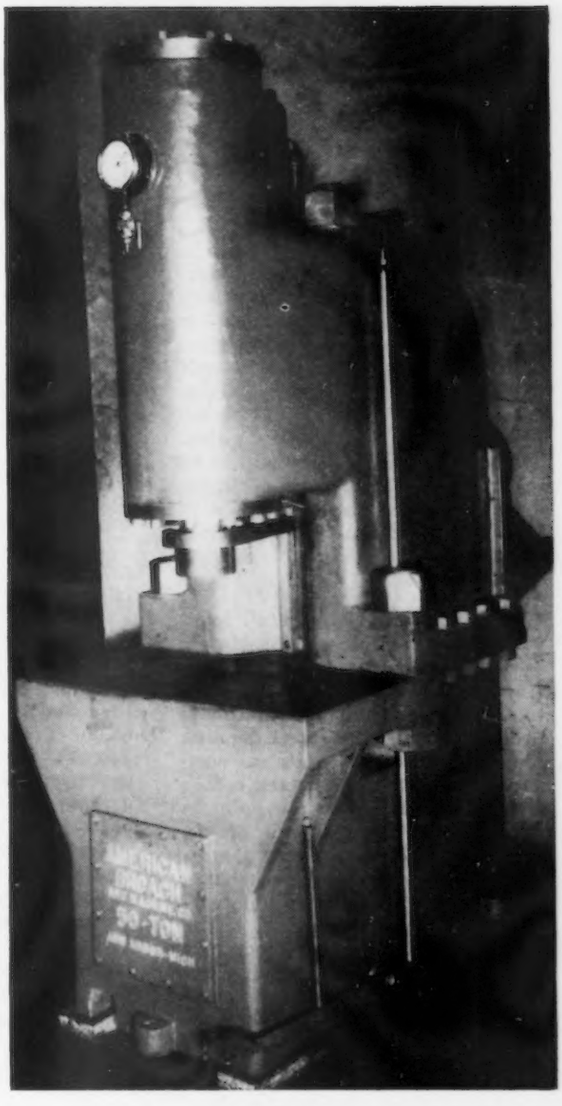
Direct drive through flexible coupling is employed. Rapid advance down, 104-in. per min. Power pressure stroke 23-in. per min. Rapid travel up, 142-in. per min. Machine stroke 24-in. A two-stage pump is used; cylinder 11½-in. diameter. Table surface 36 x 18 in. with height from floor 32 in. Approximate weight 11,000 lb.

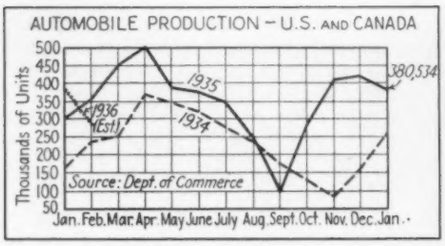
o o o

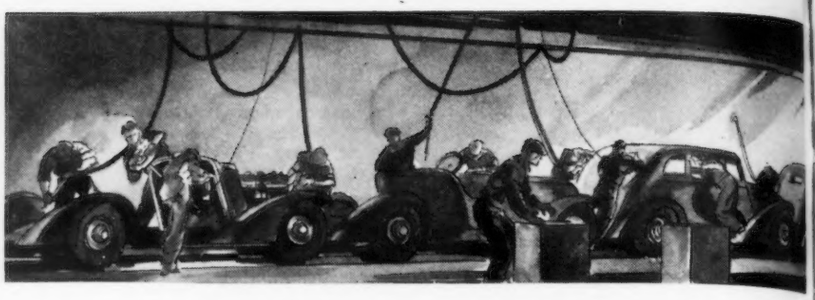
BELOW

A WIDER selection of conveyor bearings for use in its conveyor equipments has been provided by the Matthews Conveyer Co., Ellwood City, Pa., through adoption of the hexagon shaft unit illustrated. The new bearing embraces practically all sizes in the company's "knurled keylock" bearing, plus several intermediate sizes not heretofore standard.









Production Gains Steadily as March Sales Spurt

° ° °

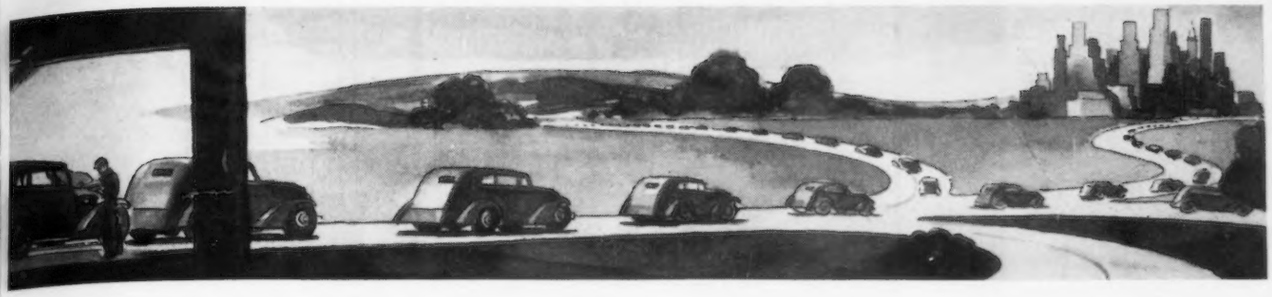
DETROIT, March 17.

ENCOURAGED by retail sales during the first week in March, automobile manufacturers are stepping up schedules from week to week. Cram's Reports estimate production for the week ending March 14 at 90,660 units, as compared with 84,705 the week before and 62,813 during the low point in February. Practically all of the local automobile plants are operating now on a five-day week basis, with the exception of the Chrysler-Kercheval plant, which is still on a four-day schedule. Plymouth is now turning out 2100 units a day and Dodge 1000 units daily, still several hundred below the January level of 1300 units daily. Ford is back to 5000 a day. Chevrolet is said to have set its March schedule at 116,000 units but may revise this schedule upward to 125,000. For April the tentative schedule is set at 135,000 units.

Chevrolet reported retail sales of cars and trucks in the United States in February totaling 70,087 units, only slightly under the sale of 75,702 units in January. Altogether, 530,000 1936 model Chevrolets have been produced to date. To indicate the drive that is being made to move used cars, February sales of used cars by Chevrolet dealers showed an increase over the similar period last year of 65,000 units, to reach a total of 149,698. Sales of used cars for the first two months are almost double that of the same period a year ago. The recent announcement of a national manager of Chevrolet's used car department and an enlargement of its staff is a further indication of increased activities in used car merchandising throughout the country.

Most of the used cars that a dealer has to handle are fairly recent models. Sales campaigns are therefore being based on the amount of unused transportation left in these cars. From the standpoint of a used car buyer, a fairly recent model in which the balance of unused transportation is unusually high, is the one that is most attractive. It happens that right now the number of used cars answering this description is exceptionally large, particularly here in Detroit, largely as a result, perhaps, of overselling the new car buyer on a quick trade-in. Such cars command rather high prices and considerable shopping about is being done to get as favorable a trade as possible. General Motors' trades are higher on the average than Ford's, probably due to higher dealer margins. So the fight is on, in the greatest battling ground in the country.

While stocks of used cars have declined appreciably in the last two weeks, owing to the more favorable weather, the used car situation is still an important one. Insofar as the dealer is concerned, he never has received sufficient support from the factory. This problem is as old as the automobile industry, and it still represents the most potent source of price cutting on new cars. Efforts of the National Automobile Dealers' Association to get the manufacturers to agree to police their books as far as profits on used car transactions are concerned, are expected to be more or less in vain. Everybody thinks that it is a swell idea, but, like prohibition, it would be a question of enforcement. The analogy is more like the mice who got together and decided to put a bell on pussy's neck so as to provide a warning of her coming. The problem was who was to tie on the bell. In this case, the question is who is going to get the few big manufac-



ASSEMBLY LINE

By FRANK J. OLIVER
Detroit Editor, The Iron Age

turers to adopt a policy that will largely favor the thousands of little fellows who handle the retail end.

February Sales High

Despite the bad weather in February, reports of sales in that month and for the first two months are showing up surprisingly well compared with other years. Preliminary estimates of passenger car registrations run around 160,000 units; trucks were 38,000, an all-time high. Members of the Automobile Manufacturers Association produced 218,270 units in February, according to a preliminary estimate. Although this figure represents a decrease of 21 per cent under the preceding month, the decrease under February, 1935, is only 1 per cent. The output of 494,715 units by A.M.A. members for the first two months of this year represents an increase of 17 per cent over the corresponding period a year ago. Of this total, General Motors' units produced 303,446 cars and trucks. February sales of General Motors' cars to dealers in the U. S. totaled 116,762 as compared with 131,134 in January. Corresponding retail sales in the United States were 96,134 and 102,034, indicating a slight decrease in the ratio of dealer sales to consumer sales from month to month.

Of all General Motors' units, Buick showed the largest percentage increase over performance a year ago. Domestic retail sales of Buicks in February totaled 6581 cars as compared with 3747 in February a year ago. The total for the two months of this year was 80 per cent higher than the volume a year ago. As an indication of the effect of weather on sales, during the last nine days of February, almost as many new Buicks were delivered to owners as during the first 20 days of the month.

Hudson reports an upturn in sales for the first week in March. Retail sales of Hudsons and Terraplanes totaled 1738 cars, exceeding the previous week by 17 per cent. February sales of Hudson units were ahead of any February since 1930.

Steel Prices Stronger

Announcement by the major steel companies of firmer prices, particularly in regard to the quantity extras, is being received in Detroit rather philosophically. There have been some squawks on the part of a few buyers, but it looks as if, for once, any amount of pressure for special privilege will fail of its goal. The chief argument right now seems to be the question of an extension of time on delivery of steel under the old price set-up. At this writing it seems fairly certain that the time will be extended to April 15, although some large buyers are even asking extensions to May 1, a full month after the second quarter prices would normally take effect.

A question yet to be answered is what effect the quantity differentials will have upon small parts suppliers to the automotive industry. Several of the larger companies have been buying steel at the quantity differential discounts, shipping it to their parts suppliers and charging them for the price they would normally have to pay in the open market. In other words, the parts buyer in this instance has pocketed the difference. Some of the small suppliers expect to lose business because of the increase in raw materials cost, but this supposition seems unreasonable in view of the fact that all their competitors will be placed in a similar position. The strength in the new price set-up lies in the fact that the differentials will apply only to a single specified grade, size and gage of material for shipment to one destination at one time.

Speaking of parts suppliers, it is interesting to note one favorable practice on the part of the Ford Motor Co. in buying parts on the outside. Compared with other large automobile manufacturers, Ford Motor has a relatively small engineering department. It has progressed as well as it has largely by taking advantage of the wealth of ideas that are available from parts suppliers and machinery builders. If a supplier can show the Ford Motor Co. that a part can be produced in the form of a stamping, for example, much cheaper than a forging and equally satisfactory from the performance point of view, the company is willing to investigate the matter thoroughly and place orders for experimental runs. If the idea is a success, that particular supplier can have at least 50 to 100 per cent of that business for the rest of time. He need not fear that the company will shop around for a better price and give the part 100 per cent to some competitor who lacked the inspiration for the particular idea. If he has tooled up for the job, his investment is safe, unless the part is discontinued. Not all the producers in this vicinity play as squarely with their suppliers.

Ford has also kept an extremely

Transferred from a back shop, this 42" ***Vertical Turret Lathe*** is the busiest unit in a large engine-terminal handling classified repairs. Sketch from actual photograph.

A Suggestion *for* Centralized Shops

And Roundhouses Doing Back Shop Jobs

THERE are many engine-terminals which inherited Class V, IV and III repairs when the division back shops were closed—also some worn out obsolete machine tools.

Machining of repair parts for modern power on these tools is a difficult job—and a costly one.

The tools in the centralized shops are likewise obsolete and expensive to operate when compared with modern cost-cutting units.

Purchase of new BULLARD Railway Equipment for the centralized shops will speed production and effect big savings. It will also release your present ***Vertical Turret Lathes*** for transfer to the roundhouse doing back shop jobs where they will play a big part in reducing the present cost of repairs.

THE BULLARD COMPANY

BRIDGEPORT CONNECTICUT

open mind on machinery developments. The company is willing to invest money in experimental machinery if the idea looks at all feasible. As a result, Ford Motor Co. is probably far ahead of any other outfit in the business as far as machine shop practice is concerned. Ford continued to buy production machinery right through the depression and kept more than one machinery supplier in the city out of the red during the lean years.

Right now there has been a hold-up for several months on purchases of standard machine tools by the company, although special-purpose equipment continues to go into the plant in the usual volume. One of the reasons behind this move is said to be the fact that competitive prices on certain standard machine tool units have often corresponded too closely, and the Ford Motor Co. is quietly making an investigation of the situation, even to the extent of sounding out foreign sources for standard machine tools.

Machinery sales in the city have been extremely active in recent weeks. Among the important buyers are a number of General Motors' units, including Chevrolet and Oldsmobile, as well as the Packard Motor Car Co., which is getting ready for a new program. Machinery suppliers are still waiting to see whether Chrysler's inquiries for its Jefferson Avenue plant are just feelers or whether present activity in the master mechanic's division will develop into orders. Incidentally, Oldsmobile's reequipment program will step up its production facilties by 50 per cent, bringing up the output to a potential capacity of 1500 units per day. Equipment is being lined up for extensions to the motor line, as well as press machinery for such parts as fenders, radiator shells and grilles, and rear axle housings.

Tool and Die Shops Speeding Up

Tool and die shops are beginning to get active on 1937 programs. In preparation for increased business in this line the Detroit Gray Iron Foundry celebrated the installation of a new electric furnace last week, which will take care of the melting of gray iron for some of the larger body dies. These castings run as much as 28 to 30 tons apiece.

As has been intimated in these columns before, a number of interesting changes are expected next year. Ford will probably go to the steel-topped roof and will probably pull out the rear end to resemble more nearly the present construction of the Zephyr. And speaking of Ford changes, the guessers now are guessing that Ford will adopt some form of hydraulic brake next year. The fact that Ford is the only major unit without hydraulic brakes is a possible answer to the reason why Chevrolet registrations have been exceeding Ford registrations in recent months. Ford will not touch anything that is covered by General Motors or Chrysler patents, but it is understood that the company is quite interested in a recent development of the Kelsey-Hayes Wheel Co. along these lines.

Composite Steels for Jail Use

(CONCLUDED FROM PAGE 43)

tional size because the ratio of soft steel substantially remains the same throughout the processing.

A comparison of the "bird-cage" type bar formation with the "box" type shown in Fig. 1B which is fast becoming obsolete, will show the improvement of this bar now generally accepted as standard. In forming the "box" type bar, only four inserts of hard steel are used; whereas, in the bird-cage type, 12 or more inserts are used and so placed as to prevent sawing or chiseling through or around these inserts.

Five-Ply Plate Used

Producing the composite plate steel used in forming the flooring and roofing, the so-called "five-ply" type is employed. This consists of three plies of soft steel to withstand breakage and two plies of hard steel to withstand cutting. The assembly of these two grades of steel is accomplished in the ingot. The two plates of hard steel are placed in a cast iron mold equidistant from each other and from the walls of the mold. The soft steel is then cast into the mold, completely surrounding the hard steel. The ingot then is rolled at a temperature of approximately 2000 deg. F. and reduced in size under great pressure. The weld between the various plies is obtained by pressure applied at this high temperature. This composite steel slab is then processed in the same manner as any ordinary steel.

Two Grades of Hard Steel

Two grades of steel are in common use in making the hard steel inserts which go into composite jail bars, channels and plates. They are known as water hardened and non-annealed steel.

Water hardened steels were the first to be used for this purpose, followed by the non-annealed type which is now specified by New York State, and in most other States, particularly for new construction because of its being generally acknowledged as an improved "fool-proof" steel.

Water hardened steel, if made hard enough to resist the hacksaw and drill is sufficiently brittle to permit breaking. If it is made soft enough to withstand breaking, it then becomes non-resistant to cutting or drilling.

Non-annealed steel heated to 1200 deg. F. is tool resistant, yet sufficiently elastic and tough to prevent breaking. To illustrate: a non-annealed bar 14 in. long, supported on knife points, can be deflected 2 in., yet come back to its original parallel position.

The Jessop Steel Co., Washington, Pa., which has recently furnished composite steel for several New York penal institutions, adheres to the following analyses in producing both inserts and softer steels which form their composite stock:

Inserts.—Carbon, 1.45 to 1.55 per cent; manganese, 8.00; silicon, 0.30 to 0.35; chrome, 4.00 to 4.50; sulphur, trace; phosphorus, trace.

Soft Steel.—Carbon, 0.15 maximum; manganese 0.50; silicon, 0.25; sulphur 0.020 maximum; phosphorus, 0.020 maximum.

These analyses, in the opinion of the Jessop company, represent a practical standard for best meeting the current rigid requirements for the application of steel in penal institutions.

A meeting of the Plain Washer Manufacturers Association will be held at the French Lick Springs Hotel, French Lick, Ind., March 23.

THIS WEEK IN WASHINGTON

Congress becoming adept at fine art of smothering the forgotten man in his sleep.

o o o

The "little fellow" can feel direct taxes, so they are taboo, but they'll get him in the end and they think he won't know it!

o o o

Theme song at the Capital is "Will They Love Me in November?"

o o o

Senate basing point hearing provides best opportunity in years for putting steel industry on spot.

o o o

Witnesses wonder why have a hearing as Senator Wheeler speaks of his pet bill in simple future tense.

o o o

BY L. W. MOFFETT
Resident Washington Editor, The Iron Age

o o o

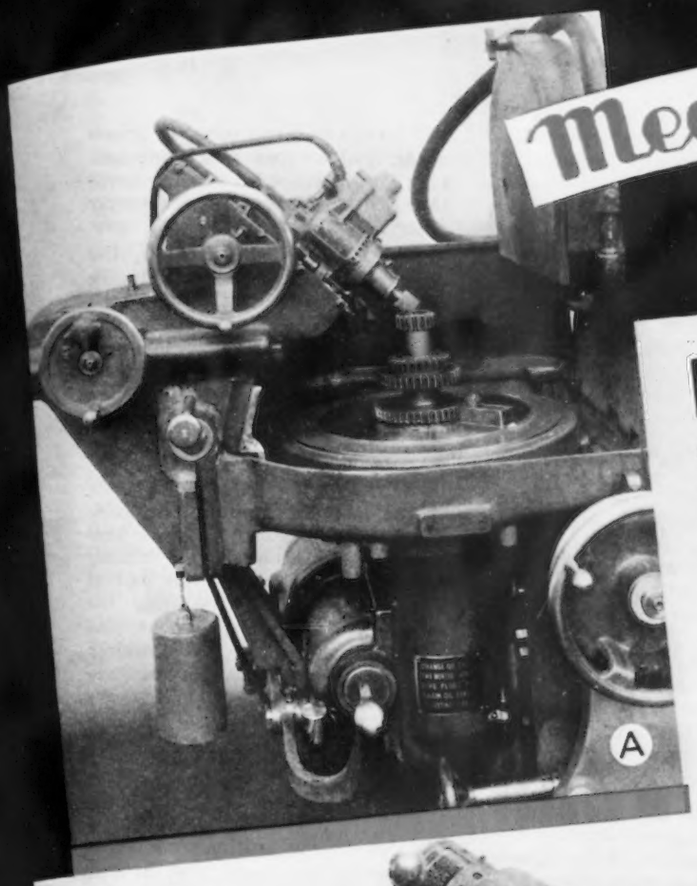
WASHINGTON, March 17.—The Administration's tax program emphasizes the difficulty of political efforts which pretend to play up to the "forgotten man." . . . The House subcommittee on Ways and Means is finding that heavy levies cannot be laid on corporate incomes without reaching down to the average citizen. . . . Hidden or otherwise, the burden will have to be shared by the "little fellow" and his wife and children. . . . It has always been thus and always will be. . . . Sweat as the subcommittee will over the various proposals of Treasury officials to raise revenue, it is seen that ultimate escape by the man in the street from part of the load is as impossible as is escape from death itself. . . .

Whether he has just made an income tax return to the Treasury or not, he has inevitably contributed. . . . His family now pays an annual indirect tax of $300. . . . Industry cannot be soaked without soaking him. . . . Members of the subcommittee already know this and no one could be more aware of it than the unusually able tax expert who heads the subcommittee, Representative Samuel Hill. . . .

Labor is aware of this fact and it was never more pointedly stated than by President William Green of the American Federation of Labor, who once said that "after all, industry is nothing but the means of collecting taxes." . . . It was a recognition of the obvious. . . . If its costs are increased industry is compelled, as a matter of self-preservation, to pass them on, either in part or wholly, to the consumer. . . . It cannot endlessly dip into reserves and surpluses and still stay in business. . . .

There is no such thing as painless taxation. . . . It will inevitably hit the whole population, though the practice of playing to certain groups admittedly has been quite successful in concealing the fact. . . . Some get more than their share of Federal largess at the expense of other groups as the latter quarrel over the spoils, but all are embraced within the jurisdiction of the taxpayer, whether he is visible or invisible. . . . And the present tax program is only a starter. . . . It is simply an inching process to continue until after election. . . . It hardly touches the surface of the enormous debt piled upon the country. . . . With a rate of only 2 per cent it just about covers interest. . . . Politicians do not propose to go all the way toward raising revenue actually required. . . . For going all the way, sooner or later, will mean lowering of income brackets which will take in a broad population with extremely small incomes who are not now tax conscious, except for rather widespread excise levies. . . . It will

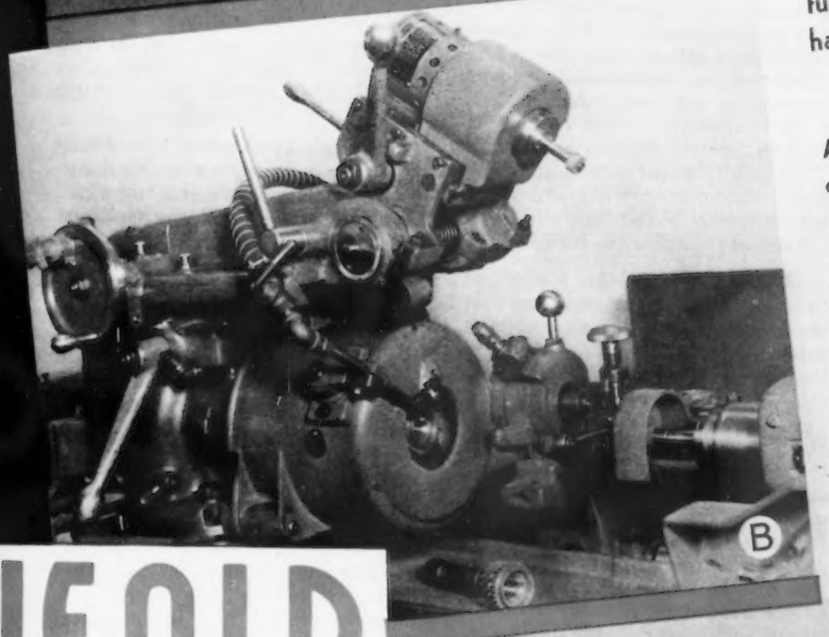
Meeting Automotive Requirements



EVEN with the most complete line of both precision grinding and boring machines, there still remains a great deal of work that must necessarily require special engineering and special equipment in order to obtain the desired tolerances and turn the parts out on a production basis.

Heald is continually designing and building equipment of this type from the simplest fixture to a complete machine. No problem is too small or too large for our engineers to give it the most careful study and consideration.

Send us prints or samples and let us furnish you complete suggestions how to handle the job. No obligation.

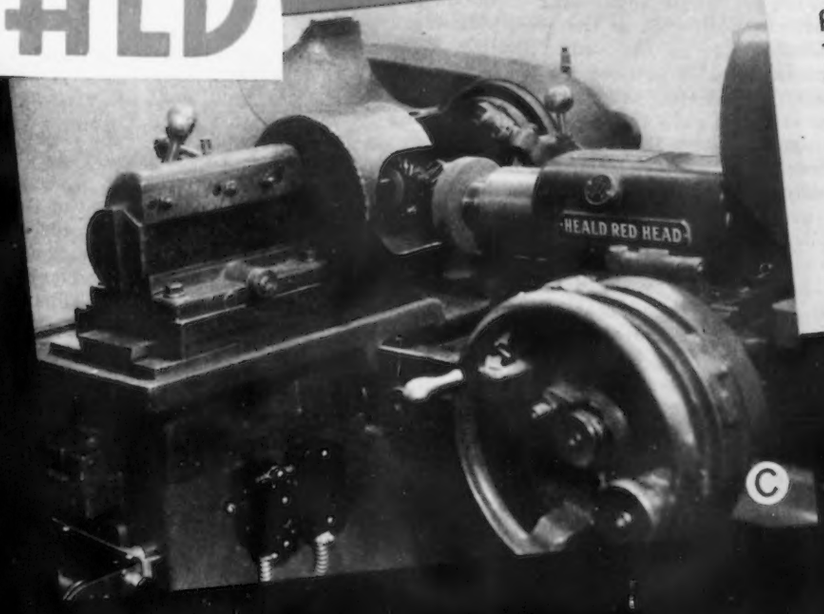


A, This automotive manufacturer required that not only the ends of his cluster gear be ground but also the bevel. An attachment as shown arranged on a No. 22 Surface Grinder handled both operations very successfully.

B, Here is a pinion gear where the hole and bevel must be ground concentric. It was handled on a No. 72A Size-Matic Internal arranged with a special grinding attachment that was dropped into position for finishing the bevel after the hole was ground.

C, On this gear the length had to be held to a close tolerance and the surface of each end must have an excellent concentric finish. It was handled with a special T-shaped base No. 72 Internal. The T-end carried a head and tail stock for holding the gear which was surface ground with a regular internal grinding wheelhead. Three of these machines are now in operation on this job.

HEALD



THE HEALD MACHINE CO.
Worcester, Mass., U. S. A.

mean also the raising of present tax rates and surtaxes applying to existing medium brackets. . . .

Frank acknowledgment of this necessary expanded taxation has been made by Senator Byrd, Democrat, of Virginia, and Senator LaFollette, Progressive, of Wisconsin, who have vainly offered such proposals. . . . The former Senator also has raised a strong voice—in the wilderness, as it were—against continuance of wild spending. . . . He realizes that unless the spigot is shut off, the barrel of revenue necessary to balance the budget cannot be filled. . . . Whatever may be eventually done in that direction, immediate plans for economies are of the popgun variety, falling far short of the necessary howitzer shooting to tear down the wall of debt. . . .

Where small dents are proposed by way of "demobilizing" any of the many useless alphabetical agencies, other agencies are being swollen to add further to the horde of government employees and to the power of a gigantic Federal bureaucracy that, disregarding Supreme Court decisions, sweeps over constitutional obstacles and wipes out State lines. . . . Choice morsels such as the Social Security act, relief funds and the newly enacted agricultural law make easy pawns of States and six have gone so far as to say they can't administer their own affairs. . . . This has happened in connection with the Guffey coal act. . . . Like Barkis, Washington is willin' and unless John Q. Public is aroused from his indifference, the tendency will go further. . . . Ending where? . . .

But the public will pay the piper and a pretty penny it will be, for it is a matter of dollars and cents as well as of personal rights. . . . He is now shelling out a half billion dollars a year in the way of nuisance taxes and many indirect taxes in addition. . . .

The new tax program is going to add to his grief. . . . That is one reason for the widespread criticism of the program. . . . And New Dealers cannot say the criticism comes only from the "greedy minority." . . . One of the most outspoken critics is Dr. Raymond Moley, formerly the President's closest advisor. . . . But as a brain truster, Dr. Moley appears to have been entirely too practical and realistic and now his advice is no longer asked for or heeded. . . . Indeed, he is no longer within the charmed circle and rarely visits the White House. . . . Dr. Moley, in *Today*, has taken a sharp whack at the tax program as being unsound. . . . He condemns the compelling of corporations to distribute their earnings on the ground that "surpluses are the life insurance policies of business firms." . . . This, of course, is in sharp conflict with the Sovietized proposal of the chief reigning brain truster. . . . For Dr. Rexford Guy Tugwell, ardent advocate of a union of farmers and workers, "which will carry all before it," sees as the first step in the control of capital the driving of "corporate surpluses into the open investment market" by means of taxation. . . .

This continuous assault on "big business" and the play to the little fellow and chosen groups has an ironical side which is apparent in pending legislation offered by those who weep political tears over the little fellow, small business, the farmer, the laboring man. . . . The gorge of such legislation is too great to be considered, but there are examples that may well be pointed out. . . . Outstanding are bills to amend the Clayton act and to give the Federal Trade Commission broader power. . . .

Such measures as the Patman-Robinson bill to prohibit price discrimination, supposed to be directed chiefly against chain stores and supported by so-called independent merchants, will cost John Q. Consumer another pretty penny if they get on the statute books. . . . Yet much is heard on behalf of the poor consumer getting stuck by high prices. . . . And "big business" is damned for doing the sticking. . . .

The steel industry, always a favorite target for political attacks, is constantly scolded for price fixing and the impression is that steel prices are as unchangeable as the laws of the Medes and Persians. . . . Rigidity of prices, Dr. Frank A. Fetter has said, is the chief obstacle to recovery according to an almost unanimous opinion of world economists. . . . He was shooting at the steel industry when he made the observation and he made it before a committee headed by Senator Wheeler whose anti-basing point bill is also directed at the steel industry. . . . It is the same Senator Wheeler who jammed his weird silver purchase program down the New Deal's throat and who is trying to push through the price discrimination legislation. . . . He is also one of the sponsors of the bill empowering the Federal Trade Commission to prohibit "deceptive practices," a measure just reported out favorably by the Senate committee and so broad that the power it would give the commission over industry would be almost unlimited. . . . "Deceptive practices!" . . . What is a deceptive practice? . . . Under the bill it will be anything the FTC wants to make it. . . . The FTC will be the business snooper, prosecutor, judge, jury and hangman. . . . And it will need a police force that will also cost another pretty penny. . . .

The Patman-Robinson bill, the O'Mahoney bill to license industry and kindred legislation are the essence of price fixing and "price rigidity." . . . It is easy to agree with Dr. Fetter on the economic unsoundness of "price rigidity." . . . The only difficulty is that the price rigidity he imagined he saw in the steel industry does not exist. . . . But it is ironical that this charge should come up before a committee whose majority members are trying to push through price control and price hiking legislation and at the same time are assailing the steel, cement, sugar, lumber and other industries for price fixing. . . . Also, at the same time they are affecting great solicitude for the little man. . . .

All so-called small independent merchants, however, do not favor the so-called anti-chain store legislation. . . . They insist they can meet chain competition by efficient methods and some add that through cooperative buying they can even beat the chain organizations because of the lower overhead costs. . . .

The legislation seems out of tune with the growing cry in Washington to reduce prices and costs. . . . Except prices for agricultural products, of course. . . . Agriculture always is a law unto itself, whether the Supreme Court says so or not. . . . Reduction of passenger rates, and of railroad cross hauling, repeal of the long-and-short-haul clause of the Interstate Commerce act, the Presidential request that railroad management and labor get together to effectuate economies are some of the moves that are intended to lower costs and to develop greater volume of business. . . . Legislation working in an opposite direction is proposed on the other hand, including the horse-and-buggy-effort to bar technological developments and even patents. . . . A House subcommittee on Labor has approved the Palmsanio resolution asking the Labor Department to make a survey of labor-saving devices and urging a 30-hr. week. . . .

Only recently the Federal Trade Commission issued a cease and desist order against the Goodyear Tire & Rubber Co. for discriminating in price between Sears, Roebuck & Co., and Goodyear's retail dealer customers. . . . The order is intended to mean that Goodyear will be denied the advantage of lower costs from mass production. . . . President P. W. Litchfield of the Goodyear company does not propose to take the order lying

down. . . . He has announced that it will be appealed to the Federal courts. . . . He stated that if it were permitted to stand the decision would wipe out a widely used trade practice under which a substantial proportion of the country's total retail business is done. . . . Pointing out that in practically every line of merchandising large distributers and others are having special brand goods produced for them at quantity discounts by independent manufacturers, Mr. Litchfield said that a great amount of capital investment has been made by stockholders of various industries to provide facilities for this type of production. . . . "This practice itself is on trial—not Goodyear," he said. . . . He also said that "it seems incongruous that a government, professing to stand for the masses of consumers, could undertake to block such an agreement." . . . Incongruous it is, but incongruity is the order of the day in Washington. . . . Loud, sanctimonious wailings for the little fellow and the consumer pour forth from political demagogues who at the same time are pushing through legislation which most merrily soaks these objects of their crocodile tears. . . . The habiliment of self-righteousness and the Pharisaical holier-than-thou pose are ostentatiously brandished before the hoaxed public as pratings against the sins of big business are mouthed. . . . The idea is to maintain a monopoly on public office and tie onto the Federal payroll, together with the high privilege of strutting across the stage and before the bright lights of imaginary or evanescent "fame." . . . It is hollow pretense, but it is costly to the beloved consumer. . . .

Unless some means is found of overcoming the effect of these political pills the consumer will pale to a more ashy pallor. . . . This prompts a suggestion: What if these assailed units of "big business" should, both as a matter of enlightened selfishness and on behalf of the consumer, build their own plants for processing the products which they are told they can no longer get at "discriminatory" prices?—Or obtain their own raw materials and have them processed by existing plants? . . . Such a move is altogether conceivable. . . . Then what would be done to crack down on benefits from mass production? . . . What other natural business law would quack politicians repeal?

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Scrap Practice Revisions Made

The standing committee in charge of Simplified Practice Recommendation R 58-28, classification of iron and steel scrap, has submitted a revision of the recommendation and the Division of Simplified Practice, Bureau of Standards, Department of Commerce, has mailed copies to all interests for consideration and approval. The original recommendation was approved at a general conference of the industry held in 1926. The first revision became effective on Jan. 1, 1928, and has since been in effect.

The recommendation specifies classes of scrap for blast, basic open-hearth, acid open-hearth, and electric furnaces, for gray iron foundry practice, Bessemer converters, and for miscellaneous scrap. A contract form for purchase of scrap is also included.

The current revision covers certain additions and eliminations to meet current needs. The revised schedule, when adopted by those at interest, will remain in effect until it is again revised by the standing committee of the industry.

Copies of the proposed revision may be obtained from the Division of Simplified Practice, Bureau of Standards, Washington.

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Manufacturers Urged to Consider Tax Bill

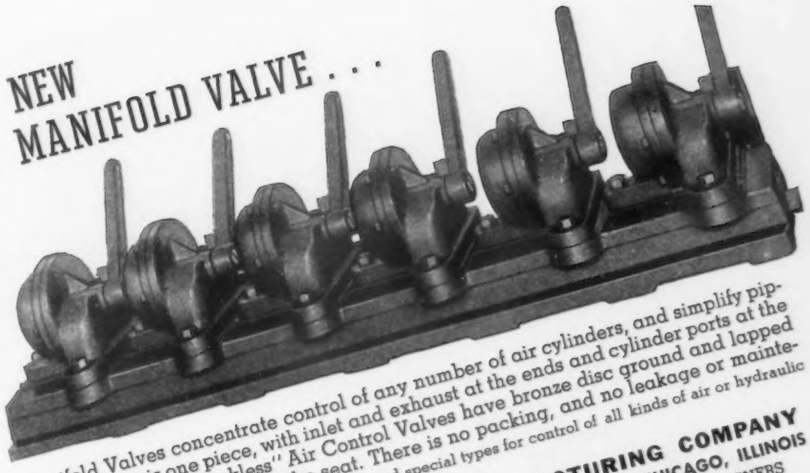
Urging that "business men withhold judgment until they have had an opportunity to study the details" of the President's new tax plan, John C. Gall, associate counsel of the National Association of Manufacturers, declared recently at Hartford, Conn., that the proposal "holds possibilities for both good and evil."

He disclosed that the tax committee of the National Association of Manufacturers is studying the plan, but that even a tentative bill has not yet been drafted.

In his speech to the Employers Association of Hartford County, Mr. Gall objected to some legislative trends in Washington, describing the so-called Walsh Government contract bill as "an instrument of boycott, oppression and discrimination."

He called attention, too, to the Van Nuys bill, already passed by the Senate, which he said "is advertised as a measure to prevent employer interference with the freedom of employees in national elections." He suggested that this measure be expanded so as to protect voters against influence from all sources, including officers and agents of the Government itself.

"Whatever may be the facts as to a temporary 'breathing spell' in other fields, we now face a permanent 'grieving spell' in the field of taxation," Mr. Gall said, in his discussion of the new tax bill. "The huge expenditures of the past three years, most of which have been met by borrowing, must at last be faced. Additional taxation is inescapable."



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Senate Hearing on Basing Point Bill Brings Out Much Justification of System

WASHINGTON, March 17.—Hearings on the Wheeler-Utterback anti-basing point bill before the Senate Committee on Interstate Commerce, which is examining steel witnesses, have been postponed from today until tomorrow. Postponement was announced later yesterday by Chairman Wheeler. He did not give a reason for the action.

Twelve steel executives appeared before the committee at the three-day hearings last week. At their conclusion Saturday, the only remaining scheduled witness was Walter S. Tower, executive secretary, American Iron and Steel Institute.

The committee will recall George L. Gordon, general manager of sales, Lukens Steel Co., Coatesville, Pa., who testified Saturday. It is reported he will be questioned further about steel deliveries by truck and water.

It is also said that the committee may ask W. A. Irvin, president, United States Steel Corpn., and Eugene G. Grace, president, Bethlehem Steel Corpn., to appear.

Clearly proposed to compel adoption of the Federal Trade Commission's long-advocated idea of f.o.b. mill pricing, the bill would eliminate the existing basing point system in such industries as steel, cement, lumber and sugar. Senator Wheeler, Democrat, of Montana, chairman of the Committee on Interstate Commerce, and Representative Utterback, Democrat, of Iowa, a member of the House Committee on Judiciary, authors of the pending bill, maintain that the basing point system is a system of price fixing, that it encourages "monopoly" and is detrimental to consumers.

Committee Favorable to Bill

The hearing before the Senate committee indicated plainly that a large majority of its members favor the bill. Both Senator Davis, Republican, of Pennsylvania, and Senator Minton, Democrat, of Indiana, by their questions and comment, showed that they are opposed to the bill and share the views of the steel industry as to the chaotic condition that would arise from its enactment. Questions of Senator Donahey, Democrat, of Ohio, were taken to mean that he is also opposed to the measure.

Especially hostile are Senator Wheeler and Senator Bone, the latter a Democrat of Washington. Both Senators were extremely caustic in examining witnesses. Senator Bone was particularly bitter in his criticism of the basing point system and the steel industry. At one point he declared that he considered the basing point system to be "pure graft." Senator Shipstead, Farmer-Laborite, Minnesota, also was sharply critical of the basing point system. His colleague from Minnesota, Senator Benson, also a Farmer-Laborite, frequently examined witnesses briefly and, while it is assumed he will support the bill and is opposed to the basing point system, he blames its existence on the alleged failure of the Department to enforce the anti-trust laws.

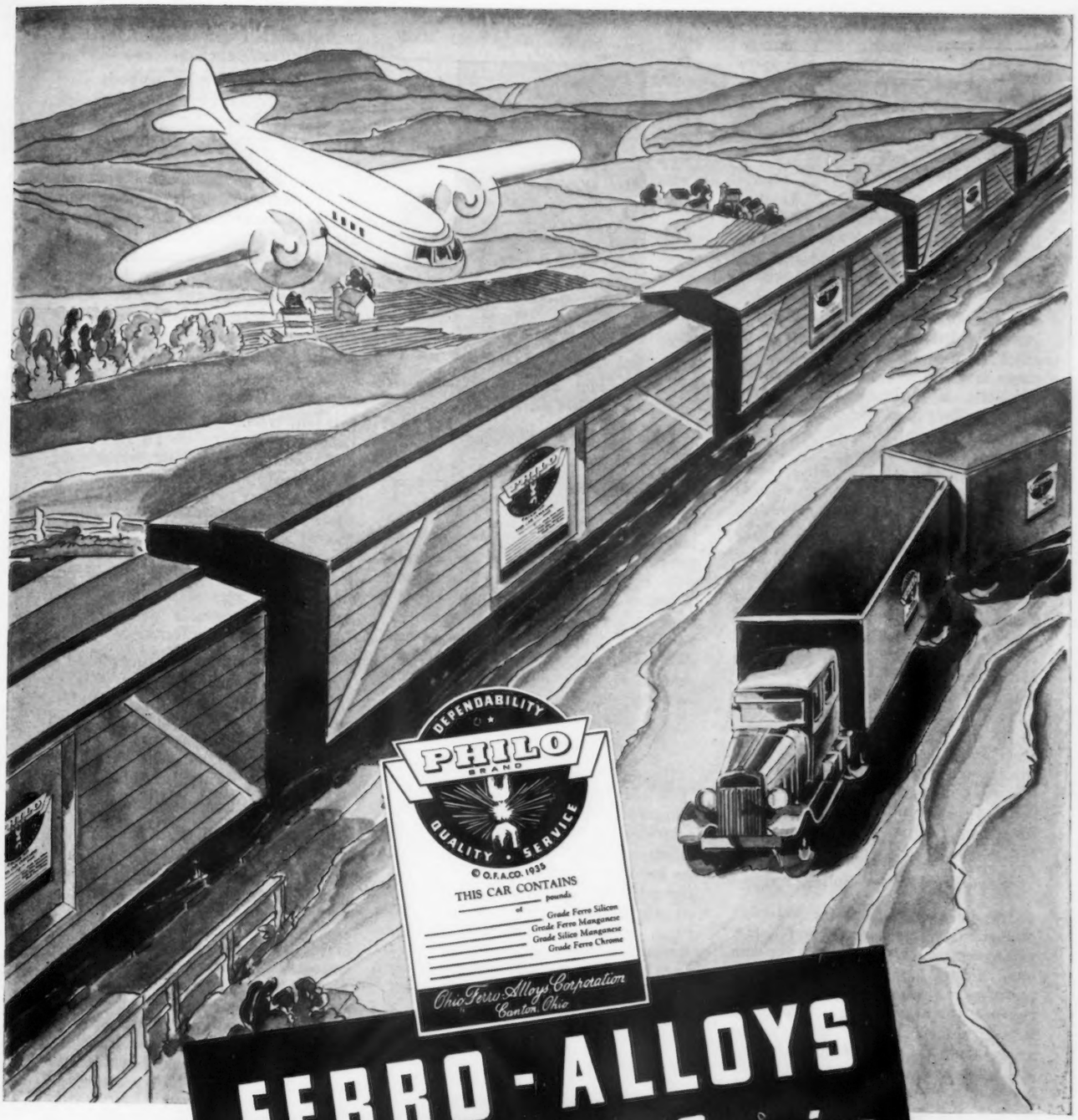
Bill Aimed at Large Enterprises

Despite the expressed purport of the bill, its underlying purpose is believed to be to compel a reduction in the entire industrial producing price structure and the slashing of profits and of salaries as well as the breaking down of "big business" units. This philosophy, as it applies to industry, is a fetish in present-day Washington. It is one of the outstanding tenets of the "brain trust." A completely contrary principle prevails toward agriculture, labor and the small merchant, as reflected in such legislation as that pertaining to farm and labor acts and taxation. The two principles tie together, of course. The thought is to take from the so-called "big fellow," regardless of his heavy losses and narrow margins, if any, and to give to the other classes. This form of distribution, as it is called, is urged on the ground that it is an "equalizing force," a means of "sharing the wealth" and of increasing purchasing power and of restoring employment and recovery. Senator Bone even said that unless the steel industry absorbs more employment it will inevitably face heavier taxation to maintain relief rolls. This is despite the fact that steel employment is virtually at a maximum.

Outcome Doubtful

It is of course not possible to say how the anti-basing point bill will fare. There are differences of opinion among those who are following the legislation closely. It does seem altogether likely that the bill will be favorably reported out of the Senate committee by a large vote. It is also conceivable that it will get to the floor of the Senate at the present session and pass that body. But it is the present view that it likely will not get out of the relatively conservative House Committee on Judiciary and therefore will not be enacted at this session. But if it gets to the floor of the House there appears to be no doubt that it will pass that branch of Congress also, thus putting it up to the White House, which has not indicated—publicly at least—its position toward the bill.

The steel representatives submitted a vast quantity of testimony to show the effects of the legislation if it is enacted. But it is probable that it will be useful simply as a matter of record so far as the Senate committee majority is concerned. Most of the committee members apparently have predetermined the case against the basing point system. While claiming to have their own minds open to conviction, their hostile attitude toward the system and the steel industry would indicate that they have closed their minds against arguments and will support the bill. One witness before the committee bluntly said it was "political legislation," a fac-



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tor which also is to be taken into serious account.

It is only fair to say that some of the Senators who sharply criticized the basing point system did grasp the rudiments of the system. Some of the other critics did not do so and seemingly are not interested in doing so.

Sitting at the left of Chairman Wheeler was Lowell Mason, former counsel for the unlamented Darrow NRA Review Board, during whose stormy career it conducted an inquisition of the steel industry. The basing point system was then the chief focal point of attack. At that time Mr. Mason showed he knew but little about the system. At present he offers Senator Wheeler advice and suggestions. With the aid of the Federal Trade Commission's report on the steel basing point system, he offered cues for critical examination of witnesses. Present also at the hearings were representatives of the Commission.

The FTC report, made during NRA's life at the request of the President, was the source of some sharp digs at the hands of former Administrator Donald R. Richberg. Mr. Richberg made a good witness for the steel industry. While not upholding the basing point system in its entirety, he agreed with the steel industry's view that uprooting it suddenly would be disastrous. He went on record in favor of the NRA recommendations for setting up group basing points in producing areas.

Senator Wheeler Solicitous?

The personable Senator Wheeler himself developed some solicitude, whatever its value, if any, for the steel industry. He gathered from testimony that some of the steel representatives thought the bill would restrict their markets to narrow areas, say 10 miles or so. He hastened to say that if that was their interpretation of the section of the bill it would be remedied inasmuch as the bill had no such purpose in view. This related to amendment of Section 2 of the Clayton anti-trust act relating to price discrimination.

In order to reassure the industry on the question, last Saturday after the conclusion of hearings on that day he called a confab of lawyers. They included: C. S. Belsterling, vice-president, United States Steel Corpn., New York; W. W. Robison, of the New York law firm of Cravath, de Gersdorff, Swaine and Wood; K. B. Halstead, general solicitor, United States Steel Corpn.; Walter Woodin, counsel, Federal Trade Commission, and Mr. Mason.

After the conference it was stated that suggestions for the proposed modification of the bill will be submitted to Senator Wheeler. The purpose of the revision will be to leave unchanged Section 2 of the Clayton Act in order to permit price discrimination under certain conditions to meet competition.

NORRIS J. CLARKE

N. J. Clarke Sees Lowering of Prices

N. J. Clarke, vice-president, Republic Steel Corpn., Cleveland, expressed a widely shared view, when he told the committee that, as he saw it, the Wheeler bill is not aimed at a method of pricing as much as "it seems to have the basic principle of lowering prices." Assuming that the bill or a similar one becomes a law, however, he predicted that instead of lower and real competition, the relatively few survivors would reap the harvest of higher prices and less competition than ever before.

E. L. PARKER

The legislation, he pointed out, would, "economists and students notwithstanding," in no way improve the situation but merely upset and create chaos in many industries. He based this view on the contention that it would result in the elimination of a considerable number of plants "after they have fought as long as they could to exist and that then, those that were left in business, due to the elimination of competition, would advance their prices and have a much clearer field with limited competition."

By example he showed Senator Minton, who was presiding at the time, how quoting on an f.o.b. mill basis would bring down prices until the lowest level had been reached, and could not be met by the smaller companies. He urged the committee to study carefully the whole picture from both the producing and consuming viewpoint and not to allow their good judgment to be swayed by theorists who are not familiar with the facts.

In the opening paragraph of a prepared statement, Mr. Clarke pointed out that the Republic Steel Corpn. is rated the third largest steel company in the country with 6,000,000 tons of ingot capacity, or approximately 10 per cent of the total. It makes a wide range of products with plants in Ohio, New York, Michigan, Illinois and Alabama, employing approximately 45,000 men having an annual payroll in 1935 in excess of $60,000,000.

"So far as the steel industry is concerned, we merely have to look at its history, to show that regardless of the practice of some 25 to 50 years of using the basing point method of selling, prices have not tended to be higher, but, on the contrary, prices have over the years steadily gone downward," said Mr. Clark. "Naturally, the keen competition which the basing point method creates has played a large part in this trend, due to the fact that it enables any mill, no matter where located, to compete for the going business in any and all territories. With the company the size of ours, with more than $200,000,000 invested in plants, we naturally require a broad base of operations, and were this bill passed, we feel that it would so circumscribe our operations that the results would not only be disastrous to many mills, but terribly confusing and disturbing to our thousands of customers.

"Frankly, I cannot recall ever having a customer complain about

the basing point method of quoting, as the main interest of the buyer is 'What is this particular lot of steel going to cost, laid down at my plant?' and when he receives his quotations, all of which cover delivery costs to his plant, his one concern is whether he is purchasing at as low a price as any of his competitors.

"From the wording of the bill, it would seem that some of you gentlemen think that freight is an added or outside item, whereas we look at it merely as one of the many items that go to make up our costs; in other words, it is no different from wages, packing, selling expense, or any of the many items that combined make up our total cost. When we go after orders in any territory, whether near at hand or far afield, we first have to consider who our likely competition will be. Normally, it is the mill making a satisfactory product, located at a basing point nearest the purchaser. Therefore, mentally, we transpose our plant to that location, and figure our delivered price accordingly.

"When you stop and consider the serious consequences that the passage of a bill of this character would create, due to the restricted consumption of steel in the territory many of the mills would have to serve, which would cause them to discontinue or move their plants, as well as the literally tens of thousands of men that would be thrown out of employment, and be forced to seek new fields of endeavor, to say nothing of the destruction of hundreds of millions of dollars of capital investment, I am sure you will conclude—after studying more completely the present methods which have operated so successfully for many years — that, economists and other students notwithstanding, the proposed bill would in no way improve the situation, but merely upset and create chaos in many industries."

Warehouses Would Not Benefit

The committee was told by E. L. Parker, president, Columbia Steel & Shafting Co., Carnegie, Pa., maker of cold-finished steel bars, that the basing point system amounts to a method of arriving at delivered prices. He objected to the bill on the ground that it would restrict the company's markets. Speaking also for Edgar T. Ward Sons Co., jobbers, Mr. Parker said that any change in the basing point system would seriously disrupt the warehouse industry with its 2000 members. He declared that if warehousemen were compelled to depend on nearby mills it would result in a great amount of confusion. Senator Wheeler questioned Mr. Parker at length regarding code prices on cold-finished bars and was told that during the entire code period there was no increase in the cold-finished steel bar differential over the hot-rolled bar price.

Lukens Sales Analyzed

George L. Gordon, general manager of sales, Lukens Steel Co., Coatesville, Pa., maker of plates, sold on a Coatesville basis, said that the company ships only 40 per cent of its products in the eastern territory and that if the basing point system is eliminated it would get less of that market and be denied the remaining 60 per cent of its markets. Replying to a question by Senator Wheeler, Mr. Gordon said he was opposed to fixing and keeping up prices and that to his knowledge that is not done. The Lukens Steel Co., he said, fixes its own prices.

W. W. SEBALD

Both Senator Wheeler and Senator Bone returned to a question insistently put to other witnesses when they asked about a buyer coming to a steel plant with his own truck to purchase steel. Mr. Gordon said it would cost more than it would if loaded into a car because the plant is not equipped for loading trucks. He estimated that it would cost about $4 a ton to load a truck but that the company would sell to a truck, regardless of the destination of the steel, at the base price, $38 a ton, plus the cost of loading. Heckled by Senator Bone because of what he acidly said was the practice of the steel industry to demand the point of delivery of steel and "fingerprints," and "birth certificates" of truckers who might come to a plant to purchase and haul away their own steel, Mr. Gordon vigorously upheld this practice. He said it was done in order to prevent a break in the market. Referring to the fact that the price of plates at Coatesville is 1.80c. a lb., he said that, in order to meet competition at Barbeton, Ohio, the company would have to absorb the freight rate of 35c. per 100 lb., resulting in a net at Coatesville of 1.635c., but if the steel is diverted to Bayonne, N. J., with a smaller freight rate from Coatesville, the effect is to break the market. On the other hand, it was explained that if the sale is made at the Coatesville base the market is unaffected and the destination of the steel and name of the buyer are not necessary.

Mr. Gordon said that the basing point system is of distinct advantage to small consumers. Without it he said they would not know what the prices are or where to buy, while big concerns, it was stated, would have means of getting this information. Queried about water deliveries, Mr. Gordon said that when shipments are made by water the Lukens company bases its prices on water rates.

John L. Neudoerfer, vice-president, Wheeling Steel Corpn., Wheeling, W. Va., with seven plants in Ohio and West Virginia, and a wide range of products, said he believed such a revolutionary change in the steel pricing system as the Wheeler bill proposes would greatly dislocate the industry and would likely wreck competition and cause confusion.

Cites Increases in Freight Rates

W. W. Sebald, vice-president, American Rolling Mill Co., Middletown, Ohio, who was the first witness when the hearings were resumed last Thursday, told the committee that elimination of the basing point system would have a most serious effect on his company and on the steel industry generally as well as on steel consumers and the consuming public. It would, he said, make necessary untold relocation of the industry with resulting loss in investment and be most serious to communities where plants are now situated.

He pointed out that when the steel plants were located conditions were far different from those of today. As he recalled it, Mr. Sebald stated, freight rates have increased 100 per cent over a period of 25 years. The effect of this increase was outlined in referring to the cost of assembling the four or five tons of raw materials necessary to make a ton of steel. He listed the tonnage requirements of each raw material entering into a net ton of hot-rolled annealed sheets and when he emphasized the

adverse effect elimination of the basing point would have on the steel industry, Senator Wheeler asked him why such an effect would follow.

"Because," replied Mr. Sebald, "it would naturally throw producers of steel into the large consuming areas."

Pointing out that the largest consuming market in the world for sheets is Detroit, Mr. Sebald said that if it were necessary to sell f.o.b. mill producers in that area would enlarge their facilities and companies shipping to it would be forced to move their equipment to it or build new equipment there. Also, he stated, all makers of fabricated products would have to pay outbound freight charges on finished material, which are higher than such charges on raw materials. Many plants throughout the country, it was declared, would be eliminated.

Replying to a question by Senator Wheeler, Mr. Sebald said that instead of bringing about competition it would have the opposite effect.

Senator Dieterich, Democrat, of Illinois, contended that the basing point system does exactly what the Guffey coal act does. The latter, the Senator said, bases coal prices on those prevailing in Pennsylvania and raises prices of Illinois coal which consumers have to pay.

"Why should steel consumers on the Pacific coast be made to pay freight which is a mere fiction and which, in my judgment, is pure graft?" snapped Senator Bone.

Mr. Sebald explained that rates are fixed on basing points and that charges are based on competitive conditions. He pointed out that it costs millions of dollars to lay down a steel plant. Citing sheets, he said that his company had developed the continuous process and showed how the improvement had lowered costs. He listed average billing prices per net ton on sheet steel obtained by his company over a range of years, as follows: 1914, $57.54; 1920, $135.54; 1925, $83.34; 1929 (year of greatest production), $73.87; 1930, $68.74; 1931, $58.89; 1932, $51.83; 1933, $45.98; 1934, $53.69; 1935, $55.34.

Cost Reduced

Mr. Sebald said that new developments in production and competition brought about lower prices despite higher costs of raw materials, freight charges and labor. Wages were said to average about 70c. an hr.

Senator Bone asked if new machinery had not eliminated many workers. Mr. Sebald replied that though operations range only between 50 and 55 per cent he thought there were more on the payroll than ever before. He attributed this fact to shorter hours.

"When you fix prices, what do you do?" asked Senator Wheeler. "Send them to the institute?"

Mr. Sebald said that, so far as he knew, there is no such practice but that on the contrary prices of steel result from the same causes making prices on other products.

Sheet prices today, said Mr. Sebald, should be at least $10 to $15 per ton higher than they are. He added that competition would not permit such an increase.

Both Senators Wheeler and Bone asked pointed questions about so-called "concerted bidding" by steel makers on Government contracts.

C. F. STONE

"All that I ask you to do is to take the money invested in steel and the returns to stockholders and you will see that there is the most strenuous competition," said Mr. Sebald.

An Integral Part of Industry

The basing point system has grown up in the steel industry, become an integral part of it and prevents confusion and rapid changes in prices, the committee was told by Charles F. Stone, president, Atlantic Steel Co., Atlanta, Ga., maker of cotton ties and hoop steel. Prices are not arbitrary but are those determined by conditions prevailing at the time the steel is used, it was declared.

Asked if the basing point system did not have the effect of eliminating competition, Mr. Stone replied that it did not. He said that the Atlantic Steel Co. prices are quoted on the Birmingham, Ala., base and said that if compelled to sell at less than other makers it could not compete and would have to move to other markets. His company, he said, has three basic open hearth furnaces with an annual capacity of 125,000 tons and that Atlanta does not enjoy the advantage of being near to raw materials but is hemmed in with competition from plants having both ocean and rail facilities and situated near to raw material sources. Imported steel, he said, is sold on the Seaboard at less than cost of production to the Atlantic Steel Co. The company, he stated, can serve consumers in its area in competition with Pittsburgh and deliver at costs less than delivered prices from that point and also give quicker deliveries.

Mr. Stone said that from a standpoint of national economy it is important that small plants continue in business for the good of both agriculture and employment. He said that when there is no employment on farms, labor comes to the steel mills and that when there is no employment in the mills labor goes to the farm.

Elimination of the basing point system, it was stated, would provide no advantage to the consuming public. Nothing in the bill, Mr. Stone said, would prevent the adoption of different f.o.b. mill quotations and producers would continue to sell at delivered prices.

"In the absence of collusion, isn't the price of steel fixed by the low cost producer?" inquired Senator Minton, Democrat, of Indiana.

"Yes," replied Mr. Stone.

"It ought to be but isn't," insisted Senator Wheeler.

President D. A. Williams of the Continental Steel Corpn., Kokomo, Ind., maker of sheets and wire products, with plants at Kokomo, and Indianapolis, Ind., and Canton, Ohio, having an annual capacity of 280,000 tons, said his company sells steel quoted at basing points nearest the places of delivery. He declared that prices are not the result of any agreement or understanding among competitors.

Questioning of Mr. Williams led into the field of industrial journal quotations. This aroused pungent comment from Senator Wheeler, who, showing his ignorance of the method of obtaining such quotations, declared that they are dictated by the steel producers, who, he said, control trade publications.

Richberg Defends System

Former NRA Administrator Donald Richberg, who also served as an administrative member of the steel code authority, indulged

in a discussion of the basing point system. Questioned by Senator Wheeler, he explained steel code provisions and declared that the original provision to fix prices where unfair trade practices were found to exist was never exercised. He said he did not know what a fair practice is except a competitive price. It would not be competitive, he added, if the price were fixed and agreed upon.

The only code provision on price determination which was exercised, it was stated, related to extras. Prices, he pointed out, were posted and could be changed by any member of the code upon 10 days notice. The code as finally approved, he told Senator Wheeler, was almost

D. A. WILLIAMS

entirely or very largely, drawn by the institute and tentatively approved for 90 days by NRA.

He said NRA took the position that counsel for the institute took responsibility for the legality of the basing point system and that it was not approved in detail by NRA but was accepted on a 90-day period. NRA investigation, he said, did develop the definite idea as to the propriety of the basing point system. NRA's observation, together with aid from outside sources, it was stated, led to the belief that every producing section should have a basing point. He said such a system is sound.

The particular evil, he said, is the denial of basing points to certain areas and the establishment of basing points where there is no production. Mr. Richberg said that for the consuming public as a whole more freight is absorbed than is charged by the steel industry. He said NRA's investigation developed this fact. His reference to establishing basing points in areas of production was based on NRA's recommendation that this be done. It grew out of an investigation order by the President. The Federal Trade Commission investigation made at the same time suggested f.o.b. mill quotations.

Mr. Richberg agreed with Senator Wheeler that cross hauling is an evil in the steel industry. He said NRA felt that continuance of the existing practice was well worth while regardless of its merits because of the labor gains made in the steel industry.

The basing point system was declared by Mr. Richberg to operate as a "certain allocation of production." He declared that if attempt is made by one legislative act to do away with the system enormous dislocation of employment and of industry together with loss of investment and capital would result.

"As I understand you, you think the system has its faults and you would not build it that way but since it is existing you would not change it suddenly?" asked Senator Minton.

Mr. Richberg said he would not build it as it is but that a sudden change would have a drastic effect through shifting of values from one section to another. He said he thought the tendency would be to control a vast volume in a few hands.

The present multiple basing point system was said to be prac-

Enlightenment in the Senate

FOLLOWING are some extracts of Senator Burton A. Wheeler's interrogation of D. A. Williams, president, Continental Steel Corpn., Kokomo, Ind., last week at the committee hearing on the Wheeler-Utterback anti-basing point bill. Senator Wheeler tries hard to show that The Iron Age and Steel are tools of the steel "trust."

Senator Wheeler obviously does not know that at least seven-eights of the circulation of both publications go to subscribers who are buyers and not sellers of steel. When informed by Mr. Williams of this fact, he intimates that consumers of steel are "largely financed bythe steel people."

The first requirement of a Senate business inquisitor seems to be that he shall possess unlimited ignorance of the subject to be investigated.

Senator Wheeler: You know they are going to fix it from the published prices? Isn't it a published price?

Mr. Williams: As you know, it has been customary for a great many years for trade papers to carry base prices.

Senator Wheeler: Yes. The trade paper represents what? Does it represent the institute?

Mr. Williams: I would say no. Now, I have been in the industry for a great many years. I have heard it said here about the industry fixing prices. Now, if you men were familiar with prices . . .

Senator Wheeler: Well, the trade paper which publishes your price is the paper which is controlled by the steel people, is it not?

Mr. Williams: I would say not.

Senator Wheeler: Don't they get practically all of their advertising from the steel people?

Mr. Williams: I would say the subscribers of the trade papers are mostly the buyers of our products.

Senator Wheeler: Mostly the buyers of your products? But aren't they to a large extent financed by the steel people?

Mr. Williams: I do not know. I subscribe to it.

Senator Wheeler: You are just one of the smaller fellows?

Mr. Williams: Yes, surely. But I do not believe so.

Senator Wheeler: But your trade paper publishes that price, whatever it is, and you take that as your cue and you fix your price accordingly, do you not?

Mr. Williams: We build up from there and build our own individual price.

Senator Wheeler: You build your own individual price based upon what is published in your trade papers and you know that what is published in your trade paper is the price that the big fellows fix it at.

Mr. Williams: No, I would have to disagree with you on that. I know our company knows of no such arrangement.

tically an f.o.b. system except where it applies to producing areas.

Smaller Producers Have Lower Costs

The most violent effect of a sudden change in the system, Mr. Richberg said in reply to a question by Senator Davis, would be to put a number of plants out of business, especially the smaller ones, while the larger ones would continue. He pointed to the fact that the steel industry has seen an "interesting thing" because of the greater growth of the smaller than the larger companies. Answering Senator Wheeler he said it was due to greater efficiency because the smaller steel companies had lower costs.

While he said he thought it desirable to change the basing point system along the lines he had suggested, Mr. Richberg explained he did not think it should be set up by law. To do so, he said, would force internal agreements. There would still remain the power to fix prices, he added.

"Even if the law is passed it is not going to take from the manufacturer the right to fix prices of his commodities in any particular area," said Senator Wheeler.

Senator Bone, who throughout the hearings showed much concern over the unemployment situation, and the so-called displacement of labor by technogolical development, said he had no faith in Government regulation.

"Two years experience has shaken my faith in it," Mr. Richberg responded with a smile. Laughter came from the audience.

Senator Benson asked if it would be necessary to enact legislation if the Attorney General enforced the anti-trust laws. Mr. Richberg said that more cooperation between business and the Government is necessary. The Government, he said, should lay down a constructive policy telling business what it can do. The anti-trust laws, he said, are not a policy but a negation.

"If this (Wheeler) measure were enacted, is it possible that we might rear a more destructive system than the one already erected?" asked Senator Donahey.

Mr. Richberg said he thought a bill trying to enforce the proposed system would result in a situation more harmful than the present one.

The NRA recommendation was declared to be a good one and one approved by a large section of the steel industry. The FTC report was declared to be a negative one which is opposed by the steel industry.

C. V. McKAIG

Carnegie Plants at Basing Points

C. V. McKaig, vice-president and general manager of sales, Carnegie - Illinois Steel Corpn., Pittsburgh, said his company sells f.o.b. customers' plants at prevailing prices and that most of the company's plants are located at basing points.

"In other words, the United States Steel Corpn. fixes the basing points?" Senator Wheeler inquired.

"Oh, no; prices are fixed naturally," replied Mr. McKaig.

He said that the present plan, which was called a merchandizing plan, is satisfactory. It can be improved and it can be modified, Mr. McKaig declared. The NRA plan was said to have a great deal of merit. The Wheeler bill would create chaotic conditions, it was stated. He said that there will be changes in the present plans as changes take place in manufacturing and consumption. When there is additional production in Detroit, Mr. McKaig, said, Detroit no doubt will become a basing point.

Senator Wheeler wanted to know why, if a buyer should drive his truck to a steel plant to haul away steel, he would be charged freight. Mr. McKaig said there would be a 65 per cent allowance because of the extra cost of loading trucks for which most plants are not equipped. They are equipped for carloading, he stated. At some length Senator Wheeler again went over prices, and was told they are not fixed; discussed possible changes in the industry if the legislation were enacted and dwelt upon identical bids submitted on Government contracts. Mr. McKaig said that manufacturers do not "get together on prices" and outlined the difference between bidding on private and Government business. One point made was that the Government has standard and rigid specifications which do not prevail generally in private industry.

St. Louis Protected

Thomas R. Akin, president, Laclede Steel Co., St. Louis, with plants at Madison and Alton, Ill., said the nearest basing point for his company is Chicago, that it absorbs more freight than it gets and that if its present margin of profits goes down further the company will have to go out of business. He said the company located in St. Louis because of the protection afforded by the basing point system and that it is advantageous to both producers and consumers.

"If it is changed we doubt that we can exist," said Mr. Akin.

The pending legislation, it was declared, would set up a vicious circle and create demoralization in the industry.

Frank A. Moeschl, vice-president Newport Rolling Mill Co., Newport, Ky., said an f.o.b. mill system will restrict markets and competition. His company's territory was declared to take less than 15 per cent of the plant's sheet capacity. It is therefore necessary, Mr. Moeschl said, for the company to meet competition at distant points. It can be met only under a basing point system, it was stated. He said that from 60 to 65 per cent of the mill production is shipped on the Gary, Ind., base. A change in the system, Mr. Moeschl said he believed, would destroy competition and create a monopoly.

As a maker of cold-rolled strips, round wire, tempered wire and many other specialties, the Wheeler bill would have a particularly bad effect upon the Thompson Wire Co., Mattanpan, Mass., said its vice-president, William B. Durkee. It employs from 300 to 350 highly skilled workers, he stated and was enabled to enter business because of the basing point system. He said the Wheeler bill is "a perfect instrument to destroy these smaller plants" to the advantage of the large companies. His company, he said, reaches markets the larger ones do because of "the blessings of the system."

When Senator Bone asked Mr. Durkee the usual question as to what would happen "if" this bill passes, Senator Wheeler interposed to say the Washington Senator made one mistake for he should have said "when" the bill passes.

Mr. Durkee said that he thought natural economic forces will do more to regulate business than any political legislation. He emphasized the dangers of the legislation in

the way of eliminating the smaller plants throughout New England.

"Some customers kick on prices but none has ever kicked on our method of quoting," the committee was told by A. S. Booth, vice-president, Sharon Steel Corpn., Sharon, Pa., maker of strip steel with plants at Sharon and at Warren, Niles, and Youngstown, Ohio.

Afraid of Restricted Market

Mr. Booth said previous remarks by Senator Wheeler had removed apprehension that the bill would compel the company to have one price at the mill and thereby make it impossible to meet "foreign" competition (competition outside the company's immediate area). He said he had been afraid the bill restricted the company to a 10-mile area.

"The bill doesn't do that," said Senator Wheeler. "If there is any such a thing in the bill it will be removed."

"What I am fearful of now is that the bill will circumscribe me on interstate commerce. Most of our business is interstate. Some of our competitors do only intrastate business," said Mr. Booth.

Senator Wheeler said that he considers that the bill affects both interstate and intrastate business.

FRANK A. MOESCHL

He said he also does not intend that the bill shall change Section 2 of the Clayton anti-trust law permitting price discrimination to meet competition. If it does change that section, said Senator Wheeler, the bill will be amended to leave the Clayton act section as it stands.

Senator Bone entered upon another of several long tirades about technological developments in the industry and their effect on employment and was joined by Senator Wheeler in suggesting that prices, profits and salaries should be reduced and production increased. The thought appeared to be that this would increase employment. But unless this is done, or industry does something to remedy the unemployment situation, industry will have to be taxed more heavily, Mr. Booth was told.

"But the steel industry probably is employing very nearly as many men as it ever did," Mr. Booth said.

The bill, he added, would throw a lot of selling power and ability to big companies and would be more helpful to them than to smaller concerns because the former can shift around or already have many plants.

"The bill would be tough on us," said Mr. Booth.

He said it would concentrate plants at consuming points.

"Wouldn't that be a good trend?" asked Senator Wheeler.

"In the long run," replied Mr. Booth. "Meanwhile I am wondering what would happen."

Senator Wheeler said that there is no "intention to do what you fear and if it (the bill) would I will be glad to go sit with your lawyers" to straighten it out.

Berry Council Makes Report to President

WASHINGTON, March 17.—Establishment of a permanent national industrial policy governing minimum wages and maximum hours "unfair" and "destructive" trade practices and control of production only in emergencies was proposed in a list of recommendations made to the President last week by committees of the Council for Industrial Progress which was set up last December by Industry Coordinator George L. Berry. A special committee report attacked the anti-trust laws as not being completely successful in preventing many "destructive, discriminatory or deceptive competitive practices which, once initiated, tend to become general under the competitive pressure which they generate." This committee urged that judicial functions of the Federal Trade Commission be transferred to an independent commission whose personnel would comprise representatives of industry, labor and the consuming public.

Unless extended by executive order or by legislation, the council as a Government organization will be terminated on April 1, inasmuch as it is operating under funds of NRA which expires on that date. Continuance of the council otherwise would depend on private appropriations in which event it would operate as a body independent of the Government though attempting to cooperate with it.

It was when Major Berry was seeking to organize the council as a so-called management-labor setup that the larger industries walked out on him. It is not now represented by such industries as steel, machinery, automotive, textile, and lumber. It is fully represented by organized labor. Major Berry presided at the council meeting with President William Green of the American Federation of Labor, and Flint Garrison, management director of the Wholesale Dry Goods Institute, acting as co-chairman.

Iron & Steel Products, Inc., Railway Exchange, Chicago, have purchased for dismantling the steel buildings of the Hammond Bolt & Nut Co., Hammond, Ind.

Welding "Clinics" to Be Held in West

A SERIES of welding clinics to demonstrate the best methods for welding various non-ferrous metals and clad materials will be held in four West Coast cities during April. Included will be practical problems involving the latest methods of both electric and oxy-acetylene welding and brazing on Monel Metal, aluminum, nickel, copper, brass, bronze, Inconel and Nickel-clad steel.

The "clinics" will be conducted by welding engineers of The International Nickel Co., the Aluminum Co. of America and the Revere Copper & Brass Co. They will be held as follows: April 3 and 4 at Wilkinson Co., Ltd., 190 West Second Avenue, Vancouver, B. C.; April 10 and 11 at Eagle Metals Co., 21 Spokane Street, Seattle; April 17 and 18 at Pacific Metals Co., Ltd., 3100 Nineteenth Street, San Francisco, and April 24 and 25 at Pacific Metals Co., Ltd., 1400 South Alameda Street, Los Angeles.

Steel Corporation's 1935 Profit of

THE United States Steel Corpn. and subsidiary companies, in the year ended Dec. 31, 1935, had a net profit available for dividends of $1,146,708, according to the annual pamphlet report to stockholders. In the preceding year, before preferred dividends a net deficit of $21,667,780 was incurred, corresponding to a deficit of $36,501,123 in 1933 and of $71,175,705 in 1932. Net profit for 1931 amounted roughly to $13,000,000, but dividend requirements greatly in excess of that figure resulted in a final net deficit for that period also. Not since 1930 has the corporation completed an annual period with a surplus net income, or income transferable to surplus after dividend payments.

In 1935 the amount of dividend payments, at the rate of 2 per cent on the preferred stock, totaled $7,205,622, and the year's loss in surplus came to $6,058,914, leaving a balance of earned undivided surplus as at Dec. 31, 1935, of $252,516,714. The corporation has not seen fit to declare any dividends on the common stock since that paid March 30, 1932, and charged against surplus on hand at the end of 1931. Cumulative dividend arrearages on the preferred stock to date of the latest payment amount to 16¼ per cent, or $58,545,679.

Due to unprofitable operations and burdensome dividend payments, the corporation has faced a total net loss of $219,696,414 for the five-year period from 1931 through 1935. This amount has been drawn from undivided surplus, and that account correspondingly reduced.

Total Earnings

Earnings and income for the year 1935, after deducting all expenses, including ordinary repairs and maintenance, estimated state, local and Federal taxes and reserves for contingencies, amounted to $60,536,812. For depletion, depreciation and obsolescence $47,222,178 was deducted. Overhead expenses and taxes charged to that portion of the Lake Superior iron ore properties and Great Lakes transportation service as was not profitably operated during the year came to $7,719,279. In addition, $4,959,780 was deducted as interest charges on outstanding bonds and mortgages, but $511,132 was added for sundry credits. There resulted a net balance before preferred dividends of $1,146,708.

Operations Higher

According to the report, "demand for products of the subsidiary companies during 1935 permitted operations of the properties on a scale in substantially greater volume than in the previous year." Based on production of rolled and finished steel products, operations during the period averaged 38.8 per cent of capacity, or nearly 25 per cent above the 1934 rate. The report likewise states that a "bet-

Shipments of United States Steel Corpn. Subsidiaries in 1935 and 1934

Domestic Shipments	1935, Tons	1934, Tons
Rolled and finished steel products	6,872,632	5,391,791
Pig iron, ingots, ferro and scrap	275,806	158,047
Coal, coke, iron ore and limestone	2,711,091	2,261,826
Sundry materials and by-products	202,070	160,035
Total tons all kinds of materials, except cement	10,061,599	7,971,699
Portland cement, bbl.	7,966,339	7,825,363
Export Shipments		
Rolled and finished steel products	474,917	514,175
Pig iron, ferro and scrap	1,393	7,546
Limestone	86,718	9,193
Sundry materials and by-products	47,528	56,453
Total tons all kinds of materials, except cement	610,556	587,367
Portland cement, bbl.	144,096	146,294
Aggregate tonnage of rolled and finished steel products shipped to both domestic and export trade	7,347,549	5,905,966

Steel Corporation Consolidated Profit and Loss Statement (Condensed)

Gross receipts from operations		$758,893,126
Operating charges		700,932,859
Operating proceeds		$57,960,267
Other income	$5,476,953	
Other charges	2,900,408	2,576,545
Net operating income before depreciation and interest		$60,536,812
Depletion, depreciation and obsolescence		47,222,178
Balance		$13,314,634
Sundry credits, etc.		511,132
		$13,825,767
Overhead expenses and taxes of Lake Superior iron ore properties and Great Lakes transportation service, etc.		7,719,279
Income before interest		$6,106,488
Interest on bonds and mortgages		4,959,780
Net income available for dividends		$1,146,708

of $1,146,708 Was First in Five Years

ter sustained operating schedule reacted favorably in securing economies." Combined with slightly higher prices realized on steel products shipped during 1935, the above mentioned factors made possible the corporation's greater earnings in the period just completed. Prices, however, showed no substantial increase, as on combined domestic and export shipments of steel products they averaged but 1.8 per cent higher than in 1934.

Production of United States Steel Corpn. Subsidiaries in 1935 and 1934

	1935, Tons	1934, Tons
Ores—iron, manganese and zinc	11,437,501	10,074,431
Limestone, dolomite, fluorspar and cement rock	7,002,036	6,043,323
Coal	15,094,540	11,724,183
Coke	7,328,083	5,382,345
Pig iron, ferro and spiegel	7,417,089	5,512,805
Steel ingots and castings	11,130,942	8,660,309
Rolled and finished steel products for sale	7,474,213	6,004,585
Portland cement, bbl	8,184,463	7,260,600

Production Increased

Production of rolled and finished steel products reached a total of 7,474,213 tons, compared with 6,004,585 tons for 1934. Shipments of these products totaled 7,347,549 tons and 5,905,966 tons respectively.

The trend of business during the year was more even than in 1934. First quarter operations averaged 37.5 per cent of capacity; second quarter operations, 36.3 per cent; third quarter operations, 37.7 per cent, while in the final quarter they were 43.8 per cent.

The number of employees working throughout the year increased by 4935 over the average 1934 total. The 1935 average was 194,820 as against 189,881 for the preceding year. The total payroll aggregated $251,576,808, compared with $210,503,533 in 1934. Average number of hours worked per week was 33.9 in 1935, or an increase of 3.8 hr. Average earnings per hr., at 73c., indicated an increase of 3c. over 1934.

The total value of business transacted during 1935 by all companies amounted to $758,893,126, and compares with gross receipts of $591,609,497 for the previous year. Total taxes accrued during the year came to $38,400,793. A year earlier they were $35,780,384. Federal income, excise and miscellaneous taxes showed the largest increase.

Net capital expenditures made by the corporation and subsidiary companies in 1935 for additional property, plant extensions and improvements amounted to $31,705,235. At the same time unexpended balances appropriated for these purposes aggregated $83,000,000 at the year's close.

The aggregate amount of inventories carried on the corporation's consolidated balance sheet at the end of 1935 was $258,804,996, compared with $257,359,655 the year before. Values were based on the lower cost or market price applicable under conditions pertaining to the stocks.

There was no change in the outstanding capital stock during the year, that of issue on Dec. 31, 1935, being 3,602,811 shares of cumulative 7 per cent preferred stock, equal to $360,281,100, and 8,703,252 shares of common stock, equal to $870,325,200.

In the accompanying tables are shown profit and loss, production, shipments and employment records.

Steel Corporation Employment Remained Fairly Constant

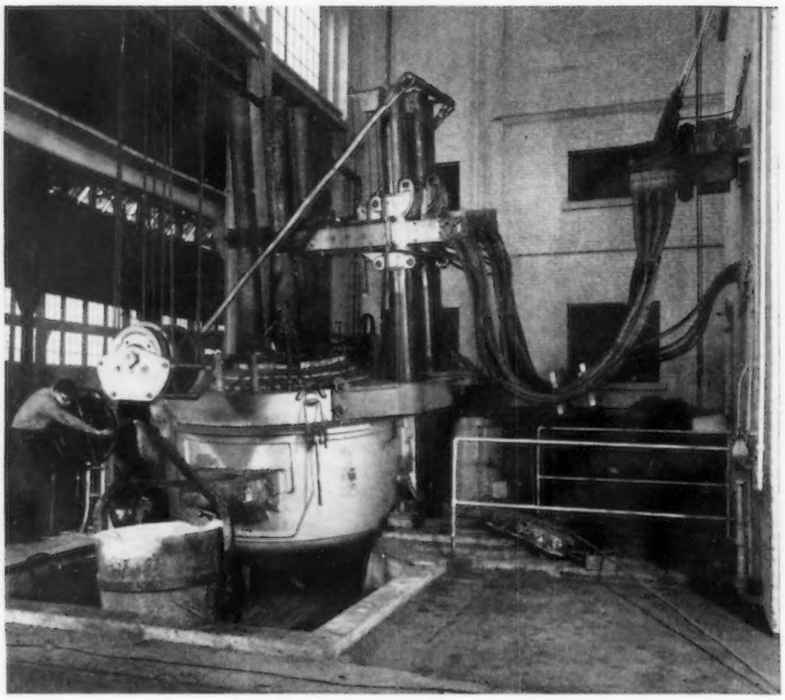
The number of employees working and the average number of hours worked were fairly constant throughout the year, the last quarter showing the largest index of time service for any of the quarters. The practice of spreading the available work among the maximum number of employees was continued to an extent consistent with operating conditions.

Quarter Ending	Actual Number of Employees Working	Total Pay Roll	Average Number of Hr. Worked per Employee: Per Month	Average Number of Hr. Worked per Employee: Per Week	Average Earnings per Employee per Hr. (Cents)
March 31	189,267	$60,201,072	145.6	34.0	73
June 30	196,938	61,948,019	143.7	33.1	73
Sept. 30	196,333	62,206,091	145.3	33.2	73
Dec. 31	196,515	67,221,626	154.4	35.3	74
Year, 1935	194,820	$251,576,808	147.2	33.9	73
Year, 1934	189,881	210,503,533	131.0	30.1	70
Increase	4,935	$41,073,275	16.2	3.8	3

The total pay roll for the years 1935 and 1934, together with a division between operating and construction work was as follows:

	1935	1934
In operations and production	$246,508,043	$207,564,103
In construction work	5,068,765	2,939,430
Total	$251,576,808	$210,503,533

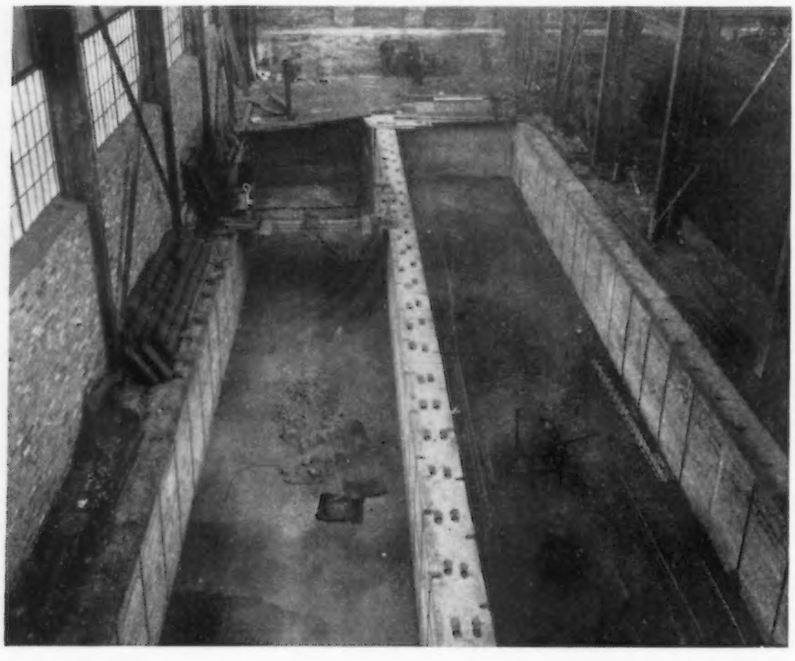
Detroit Gray Iron Pours "Lektrokast"



ON Saturday, March 14, the Detroit Gray Iron Foundry Company held open house to all its friends at the official opening of its new Electric Furnace Division. Several thousand executives and engineers in the metal-working industry attended. The new addition to the foundry was completely dolled up with scenery to imitate Florida as we know it at this season. Refreshments were served while a "German Band" of World War Veterans entertained the visitors about the floor, and an orchestra held forth at another end of the shop.

The occasion for all these festivities was the recent installation of the largest electric furnace to be installed in a jobbing foundry in this territory. The equipment illustrated, which was made by the Pittsburgh Lectromelt Furnace Corpn. of Pittsburgh, is nominally rated at three tons per hour cold melting capacity. Actually, the unit is used in the duplexing process and will refine 10 to 15 tons per hour of hot metal from the cupola. The time of duplexing in the electric furnace is from 20 to 22 minutes. The cupola which serves this unit is 100 in. capacity, lined up to 82 in.

To take care of the additional space required for the furnace and also to provide extra molding capacity, two of the original bays of the plant have been extended and an additional bay with a high crane has been added. Three new concrete-lined pits have been installed, two of them 132 ft. long and one of them 98 ft. in length, each being 15 ft. wide and 8 ft. deep.



The Detroit Gray Iron Foundry Company serves principally body die tool shops and body manufacturers in the automotive industry. Practically all the metal cast goes into large body dies which run in the larger sizes up to 28-30 tons. With the new equipment the company will be in a position to handle castings up to 50 and 60 tons, although it is not anticipated that any body dies in the near future will run more than 40 tons of cast iron. What is said to be one of the most efficient cupolas in this section is available from which metal is poured at a temperature of approximately 2800 deg. F. In the new electric furnace the temperature is raised to 3000 deg. for super-refining. Vanadium and nickel iron and semi-steel castings are the regular output of these units. The only scrap charge in the cupola are breakable dies which come from the automobile body plants themselves.

Iron coming from the cupola is poured into 5-ton ladles, where it can be held up to 1½ hr. so as to make the maximum batch of 15 tons for the electric furnace. For the larger dies batches of 10 to 15

(CONCLUDED ON PAGE 103)

PERSONALS

H. J. BAUGH, assistant general superintendent in charge of production, Carnegie - Illinois Steel Corpn., Youngstown, will be chairman of the annual spring engineering conference of the Association of Iron and Steel Engineers to be held in Youngstown, April 22 and 23.

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LAIRD U. PARK, who has been identified with the pig iron trade for many years, has been appointed Philadelphia district representative of JAMES S. MCKESSON, Pittsburgh, special agent for the sale of pig iron produced by the Carnegie-Illinois Steel Corpn. Mr. Park's headquarters will be in Real Estate Trust Building, Philadelphia.

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E. E. REAGLE has been appointed general superintendent of all plants of the Sharon Steel Corpn., Sharon, Pa. JAMES M. MAY has been appointed assistant general superintendent; WALTER F. JACKSON, superintendent of the Sharon plant, and L. L. WILSON, assistant superintendent of strip mill.

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HARRY A. WINNE, formerly in charge of the steel mill section of the industrial engineering department, General Electric Co., has been made manager of the mining and steel mill section, succeeding K. H. RUNKLE, who was recently made an assistant manager of the industrial department. JOHN C. MILLER, who has been in charge of the industrial engineering department's aeronautical section, has been appointed manager of sales for that section. Mr. Winne has been identified with the company since his graduation from Syracuse University in 1910. Mr. Miller, who attended Princeton University, joined the company during his summer vacation from that institution in 1926.

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FRED CLEMENTS, director of the Park Gate Iron & Steel Co., Rotherham, England, has been awarded the Bessemer Gold Medal for 1936 by the British Iron and Steel Institute, in recognition of his distinguished services in improving the technology of the iron and steel industries, and, in particular, blast furnace practice.

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ERNEST F. FISHER, formerly foundry and machine shop superintendent of the Fisher Machine Works Corpn., Leavenworth, Kan., has been appointed superintendent and assistant manager of the Illinois Foundry Co., Springfield, Ill.

H. J. BAUGH

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J. E. DONALLY has been made sales representative in the St. Louis and surrounding area for the LaSalle Steel Co., Chicago. He will make his headquarters at 6108 Oakland Avenue, St. Louis.

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GEORGE BIRKENSTEIN has resigned from the presidency of S. Birkenstein & Sons and has organized his own metals company, which is known as the George Birkenstein Corpn., 332 South Michigan Avenue, Chicago. This new organization has smelter and warehouse connections and is dealing in scrap metals. Mr. Birkenstein was with his old associates for 17 years. He is a past-president of the National Association of Waste Material Dealers.

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CARL C. HENNING, assistant general metallurgist, Jones & Laughlin Steel Corpn., addressed a meeting of the Pittsburgh chapter of the American Society for Metals in the Roosevelt Hotel on March 12, on the subject, "Bessemer Steel." Mr. Henning recently was awarded the Robert W. Hunt medal of the American Society of Mining and Metallurgical Engineers.

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W. OTTO WINTER, manager of the small tools division, Whitman & Barnes, Inc., was elected chairman of the Detroit chapter of the American Society of Tool Engineers at a meeting held on March 12. ANDREW E. RYLANDER, efficiency engineer of Midland Steel Products Co., was elected secretary, and WILLIAM SMILA, master mechanic of the Jefferson Avenue plant, Chrysler Corpn., was elected treasurer. T. B. CARPENTER of the Pioneer Engineering Co. is the retiring chairman of the chapter.

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E. S. TAYLERSON, heretofore manager of the research laboratory of the American Sheet & Tin Plate Co., has been appointed research engineer. G. N. SCHRAMM has been made manager of the research laboratory, and J. A. SCHLEGEL has been appointed assistant manager industrial relations.

Standardization Aids Mixer Business

DIFFICULTY has long been experienced in the concrete mixer manufacturing industry because of lack of standardization in sizes, specifications, ratings, and mechanical and accessory requirements. In 1924 the Associated General Contractors of America decided to cooperate with a group of mixer manufacturers in the standardization of construction equipment so that waste brought about by unrestricted competition in sizes and designs might be eliminated. The manufacturers became known officially as the Mixer Manufacturers' Bureau. Many months of study preceded the first announcement of standards in October, 1924, and although these were far from perfect, immediate results were apparent which brought to an end the frenzied era of developing new models, sizes and designs and placed in its stead a period in which service to the contractor was the keynote of design.

Eight revisions of the standards have been made since 1924 and the ninth is now in process. The net effect of these standardization programs has been a substantial contribution to the industry and has enabled the manufacturer to give greater value per dollar invested in mixer equipment. Taken all in all, it has contributed to the control of construction costs in general to the end that continuous investment by the public in construction projects might be encouraged.

NEWS OF THE WEEK

Quantity Extras to Be Applied on Alloy Steel Bars, Slabs and Blooms

QUANTITY concessions to large lot buyers have been adopted for hot-rolled alloy steel bars and alloy billets, slabs, blooms and ingots. Heretofore no quantity deductions had been allowed but extras have been charged for quantities coming under the base range and these extras have been sharply increased.

The present base prices of 2.45c. for hot-rolled alloy bars, $49 per gross ton for alloy billets, slabs and blooms and $40 for ingots have been reaffirmed for the second quarter. The deductions and the revised extras are as follows:

ALLOY QUALITY HOT-ROLLED STEEL BARS

100 net tons and over	Deduct	$0.15	per 100 lb.
Under 100 net tons to 50 net tons, inc.	Deduct	.10	per 100 lb.
Under 50 net tons to 25 net tons, inc.	Deduct	.05	per 100 lb.
Under 25 net tons to 3 net tons, inc.	Base		
Under 3 net tons to 2 net tons, inc.	Add	.10	per 100 lb.
Under 2 net tons to 1 net ton, inc.	Add	.25	per 100 lb.
Under 1 net ton to ½ net ton, inc.	Add	1.00	per 100 lb.

ALLOY QUALITY BILLETS, SLABS, BLOOMS AND INGOTS

100 gross tons and over	Deduct	$3.00	per gross ton
Under 100 gross tons to 50 gross tons, inc.	Deduct	2.00	per gross ton
Under 50 gross tons to 25 gross tons, inc.	Deduct	1.00	per gross ton
Under 25 gross tons to 3 gross tons, inc.	Base		
Under 3 gross tons to 2 gross tons, inc.	Add	2.00	per gross ton
Under 2 gross tons to 1 gross ton, inc.	Add	5.00	per gross ton
Under 1 gross ton to ½ gross ton, inc.	Add	20.00	per gross ton

Cold-Finished Bar Information Published

SPECIFICATIONS called for by several large automobile manufacturers on cold-finished carbon and alloy steel bars are included in a 45-page booklet published by the American Steel & Wire Co., 208 South LaSalle Street, Chicago. Ford, General Motors and Chrysler requirements for carbon steels, free cutting steels, manganese steels, nickel steels, nickel chromium steels, chromium steels, Chrysler Corpn. steels, molybdenum steels, chromium vanadium steels, silicon manganese steels, silicon steels, U. S. S. high tensile steels, chrome nickel corrosion and heat resisting steels and straight chrome corrosion and heat resisting steels are covered.

A large part of the booklet is concerned with the company's Amercut cold-finished steel bars. Information is provided as to the calculation of surface speed in ft. per min., for machinability rating, finishes, lengths, identification of stocks and metallurgical services. The publication also describes the various grades of Amercut, physical properties and recommended heat treatments.

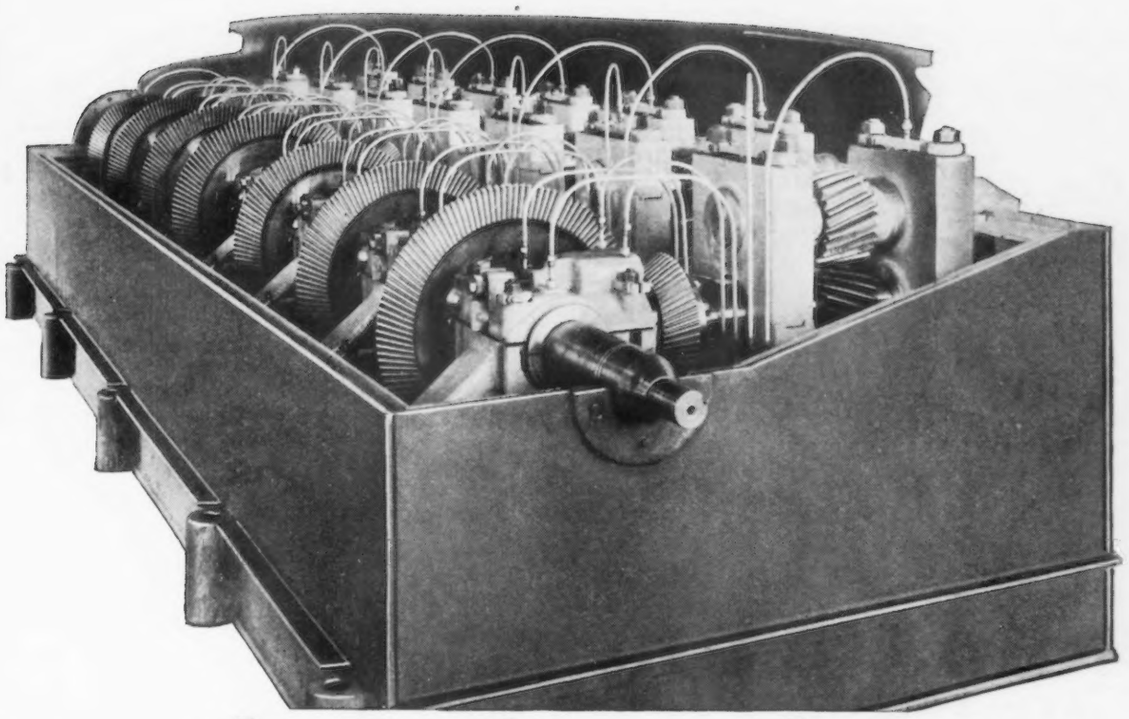
A discussion of grain size and normality, with eight pages of photomicrographs obtained from the American Society for Testing Materials and the United States Steel Corpn. research laboratory, is also in the booklet. Tap drill sizes and thread data, American national fine thread series, drill diameters for number, letter, fractional and metric sizes, decimal equivalents of millimeters and fractions and parts of an inch, approximate relationships between various hardness values, average physical properties of various steels, and wire gages now in use are contained in tabular form.

The booklet is one of the most complete commercial treatises on cold-finished bars that has ever been presented to industry. It is believed the publication will help steel users reduce stock sizes and standardize their procedure in conformity with the best practice.

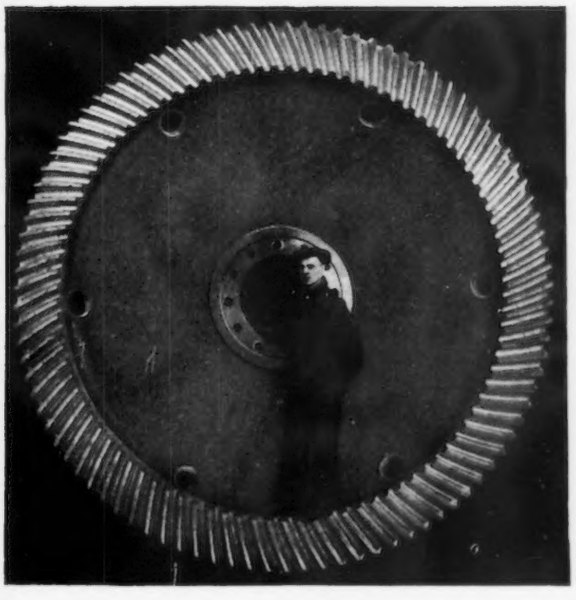
Empire Shipments High in 1935

EMPIRE SHEET & TIN PLATE CO., Mansfield, Ohio, during 1935 expended over $300,000 in new installations, according to a statement concerning the activities of the company last year sent to the stockholders by C. H. Henkel, president-treasurer.

The installations included tin plate and terne plate equipment providing an annual capacity of 600,000 base boxes of coke tin plate and 15,000 tons of long terne sheets. The company produced 119,414 tons of sheets at its Mansfield works during the year, representing practically 100 per cent production, and shipped 113,159 tons, which was in excess of any previous annual shipment from Mansfield.



Smooth Delivered Power–



for HIGH SPEED FINISHING MILLS

Continuous Precision—that much desired quality in rolling mill output—requires precision machines, perfect coordination. That is why MORGAN has always stressed the importance of "Morgan throughout."

Accurate rolling requires precision in rolls, bearings, housings—*and drives.*

Here is a typical Morgan drive, designed and built for a high speed continuous rolling mill. It is a precision machine with spiral bevel gears spray lubricated, with precision bearings force-feed lubricated. Each gear and pinion is held in permanent alignment; all gears are supported between journals by Morgan's special T-bearing construction. The entire unit is compact to conserve space, rugged to withstand sudden impact, continuous operation. Enclosed in a welded steel housing.

The Morgan Construction Company designs and manufactures the world's largest spiral bevel gears.

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R5

SPIRAL BEVEL GEAR DRIVES

MANUFACTURERS OF THE WORLD'S LARGEST SPIRAL BEVEL GEARS

British Steel Makers Still Swamped With Orders—Exports Increasing

LONDON, March 16 (*By Cable*).—Steel works' most urgent requirements for pig iron are now overtaken by production. Further furnaces will be ready for relighting soon and one at least will supplement the inadequate supply of foundry iron. The increased output is certain of prompt absorption.

Makers of semi-finished steel are still unable to accept orders except for late delivery and import, and the quota may be increased further. Finished steel works are very busy and expect an increasing demand as the year advances and government defense plans mature. Many works which have sold heavily for future are reluctant to accept further orders. There are heavy specifications from engineers, shipbuilders and motor car works. There are large orders for rail. A marked revival in export trade is evident.

Tin plates' home demand is good but export business is only moderate. In view of continued good demand and higher steel prices an early price advance is likely and many makers are already quoting above the schedule price.

Continental iron and steel market is active despite political tension. Belgian home demand is strong in anticipation of further home price advances.

International steel cartel is maintaining production for second quarter at 525,000 tons monthly.

United Kingdom February exports of pig iron were 6700 tons, of which 150 tons were shipped to United States. Total of iron and steel were 168,000 tons.

British Prices, f.o.b. United Kingdom Ports

Per Gross Ton

Ferromanganese, export	£9
Billets, open-hearth	£5 17s. 6d. to £6 2s. 6d.
Tin plate, per base box	18s. 9d. to 19s. 1½d.
Steel bars, open-hearth	£7 17½s.
Beams, open-hearth	£7 12½s.
Channels, open-hearth	£7 17½s.
Angles, open-hearth	£7 12½s.
Black sheets, No. 24 gage	£9 15s.
Galvanized sheets, No. 24 gage	£11 15s.

Official Continental Prices, f.o.b. Continental Ports

Per Metric Ton, Gold £

Current dollar equivalent is ascertained by multiplying gold pound prices by 124.14 to obtain franc equivalent and then converting at present rate of dollar-franc exchange.

Billets, Thomas.	£2 7s.
Wire rods, No. 5 B.W.G.	£4 10s.
Steel bars, merchant	£3 5s.
Sheet bars	£2 8s.
Plate, ¼ in. and up	£4 6s. 6d.
Plate, 3/16 in. and 5 mm.	£4 5s.
Sheets, ¼ in.	£4 10s.
Beams, Thomas.	£3 2s. 6d.
Angles (Basic)	£3 2s. 6d.
Hoops and strip base	£4
Wire, plain, No. 8	£5 7s. 6d.
Wire nails	£5 15s.
Wire, barbed, 4 pt. No. 10 B.W.G.	£8 15s.

Acquires Lavino Refractories Plant

THE North American Refractories Co., Cleveland, has acquired the silica brick plant and property of the Lavino Refractories Co., formerly owned by E. J. Lavino & Co., at Womelsdorf, Pa. No other property of E. J. Lavino & Co. is included in this transaction.

The addition of the Womelsdorf plant to the Mt. Union, Pa., plant gives the North American company two modern and efficient plants for the exclusive manufacture of high grade silica brick, which, with fire clay brick plants in Pennsylvania, Kentucky, Missouri, Ohio and Maryland, makes fifteen plants now operated by the company.

Moore New Chairman Of Electric Hoist Group

AT the nineteenth annual meeting of the Electric Hoist Manufacturers Association held in Chicago on March 4, Charles A. Moore, chairman-of-the-board of Manning, Maxwell & Moore, New York, was elected chairman of the association, succeeding C. O. Hedner of Yale & Towne Mfg. Co. Shaw-Box Crane & Hoist Co., a member of this association, is a subsidiary of Manning, Maxwell & Moore.

A. S. Watson, vice-president of Detroit Hoist and Machine Co., Detroit, was elected vice-chairman.

Capital Goods Activity in Slight Gain

A SLIGHT gain of 0.1 point in THE IRON AGE index of capital goods activity for the week ending March 14, has established the index at 75.7 per cent of "normal" as measured by average business conditions during the 1925 to 1927 base period. Excepting in degree, there occurred no material change in the trends of the component indices from two weeks ago. As at that time steel ingot output, automobile production and lumber shipments tended upward, but Pittsburgh industrial activity and heavy construction work continued downward.

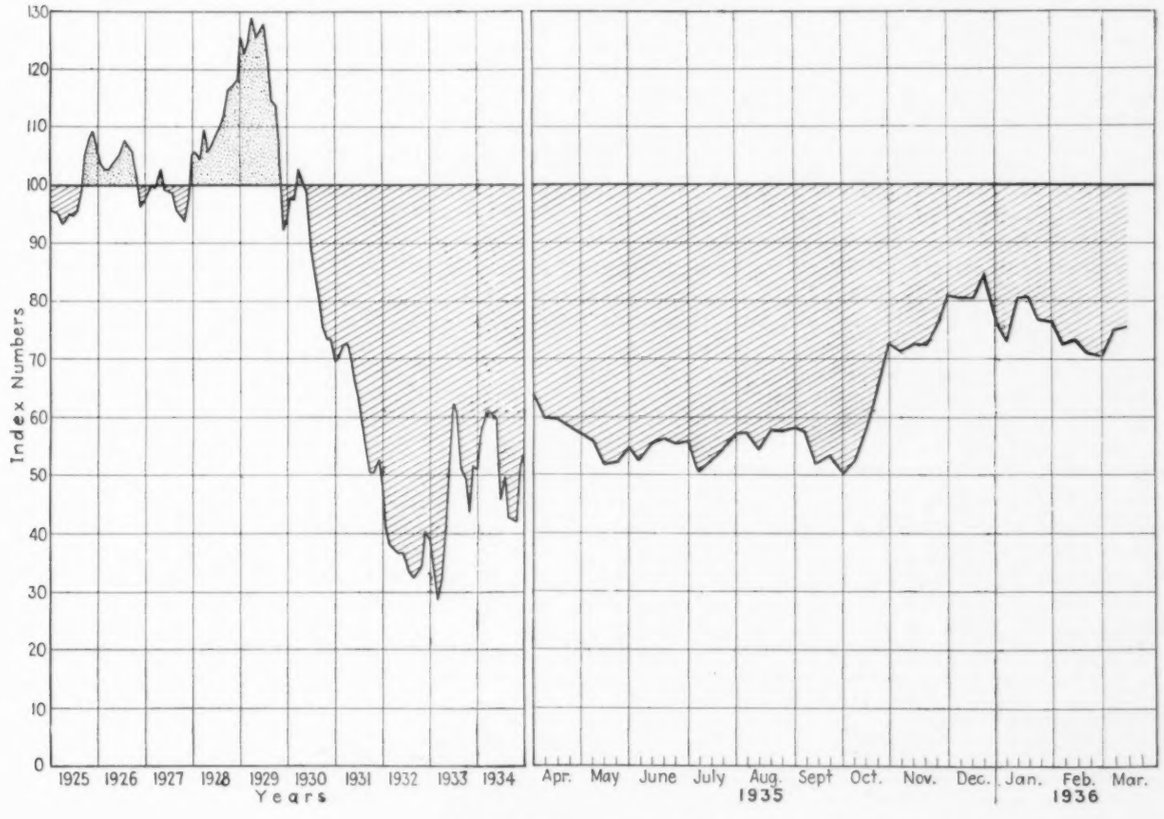
The combined index's present level of 75.7 contrasts markedly with earlier-year comparisons. It is approximately 25 per cent above the comparable 1935 level, 23 per cent above the comparable 1934 level and 192 per cent above where it stood at this time in 1933.

Among the index's component series, all of which are adjusted for normal seasonal change, steel production advanced 0.8 point from the preceding week; automobile production advanced 1.3 points; and lumber shipments advanced 1.2 points. Pittsburgh industrial activity declined 0.9 point, and construction work in progress fell 1.7 points.

The Iron Age Weekly Index Numbers of Capital Goods Activity

(1925-'27 = 100)

Last week	75.7
Preceding week	75.6
Same week last month	74.3
Same week 1935	60.5
Same week 1934	61.3
Same week 1933	25.9
Same week 1932	38.3
Same week 1931	71.5
Same week 1930	95.3
Same week 1929	124.2



(1925-27 Average = 100)

THE Iron Age Index of Capital Goods Activity. The years 1925 to 1934 are plotted by months, by weeks since 1935.

Components of the index: Steel ingot production rate, from THE IRON AGE; revenue freight carloadings of forest products, from Association of American Railroads; automobile production from Cram's Automotive Reports; heavy construction contract awards, from *Engineering News Record;* index of productive activity in Pittsburgh district, from Bureau of Business Research of University of Pittsburgh.

Current Metal Working Activity Statistically Shown

These Data Are Assembled by The Iron Age from Recognized Sources and Are Changed Regularly as More Recent Figures Are Made Available.

	February, 1936	January, 1936	February, 1935	Two Months 1935	Two Months 1936
Raw Materials:					
Lake ore consumption (gross tons)[a]	.....	2,951,568	2,467,269	4,747,662	.....
Coke production (net tons)[b]	.....	3,450,342	2,873,432	5,762,984	.....
Pig Iron:					
Pig iron output—monthly (gross tons)[c]	1,827,972	2,025,885	1,608,552	3,085,888	3,853,857
Pig iron output—daily (gross tons)[c]	63,034	65,351	57,448	52,303	64,231
Castings:					
Malleable castings—production (net tons)[d]	.....	48,414	41,377	84,777	.....
Malleable castings—orders (net tons)[d]	.....	44,116	41,225	85,793	.....
Steel castings—production (net tons)[d]	.....	.....	31,725	64,074	.....
Steel castings—orders (net tons)[d]	.....	.....	29,687	58,722	.....
Steel Ingots:					
Steel ingot production—monthly (gross tons)[e]	2,967,803	3,049,439	2,777,765	5,649,296	6,017,242
Steel ingot production—daily (gross tons)[e]	118,712	112,942	115,740	110,771	115,716
Steel ingot production—per cent of capacity[e]	54.09	*51.46	52.28	50.04	52.7
Employment in Steel Industry:					
Total employees[e]	.....	.....	420,397	413,734	.....
Total payrolls (thousands of dollars)[e]	.....	.....	$44,213	$88,541	.....
Average hours worked per week[e]	.....	.....	35.6	34.6	.....
Finished Steel:					
Trackwork shipments (net tons)[e]	4,116	3,366	2,892	5,225	7,482
Steel rail orders (gross tons)[c]	147,450	214,541	80,174	131,174	361,991
Sheet steel sales (net tons)[f]	.....	174,805	183,322	505,153	.....
Sheet steel production (net tons)[f]	.....	223,000	219,062	454,776	.....
Fabricated shape orders (net tons)[g]	.....	117,218	75,841	140,147	.....
Fabricated shape shipments (net tons)[g]	.....	73,710	68,527	158,154	.....
Fabricated plate orders (net tons)[d]	.....	38,709	15,064	33,842	.....
Reinforcing bar awards (net tons)[c]	23,830	67,810	22,265	40,015	91,640
U. S. Steel Corpn. shipments (tons)[h]	676,315	721,414	583,137	1,117,192	1,397,729
Ohio River steel shipments (net tons)[i]	.....	65,760	64,369	117,025	.....
Fabricated Products:					
Automobile production, U. S. and Canada[k]	.....	380,554	353,781	657,173	.....
Construction contracts, 37 Eastern States[l]	$142,050,200	$204,792,800	$75,047,100	$174,821,000	$346,843,000
Steel barrel shipments (number)[d]	.....	535,370	402,928	841,262	.....
Steel furniture shipments (dollars)[d]	.....	.....	$1,064,219	$2,203,716	.....
Steel boiler orders (sq. ft.)[d]	.....	623,426	283,726	675,510	.....
Locomotive orders (number)[m]	46	14	1	1	60
Freight car orders (number)[m]	7,236	1,050	806	830	8,280
Machine tool index[n]	112.1	110.8	53.0	†6.15	.....
Foundry equipment index[o]	110.4	127.0	75.7	†76.4	†118.5
Foreign Trade:					
Total iron and steel imports (gross tons)[p]	.....	50,489	28,905	51,689	.....
Imports of pig iron (gross tons)[p]	.....	15,033	10,741	12,774	.....
Imports of all rolled steel (gross tons)[p]	.....	22,958	12,443	27,497	.....
Total iron and steel exports (gross tons)[p]	.....	241,564	228,537	491,277	.....
Exports of all rolled steel (gross tons)[p]	.....	79,100	67,329	140,725	.....
Exports of finished steel (gross tons)[p]	.....	74,254	59,147	125,670	.....
Exports of scrap (gross tons)[p]	.....	153,906	151,720	331,350	.....
British Production:					
British pig iron production (gross tons)[r]	584,700	595,500	483,100	1,004,300	1,180,600
British steel ingot production (gross tons)[r]	938,500	912,500	769,500	1,527,300	1,851,000
Non-Ferrous Metals:					
Lead production (net tons)[s]	.....	36,296	27,495	56,809	.....
Lead shipments (net tons)[s]	.....	34,590	32,523	66,218	.....
Zinc production (net tons)[t]	36,228	*41,917	33,468	68,603	78,145
Zinc shipments (net tons)[t]	39,918	46,468	34,877	70,332	86,386
Deliveries of tin (gross tons)[v]	5,600	6,635	3,905	8,505	12,235

†Three months' average. *Revised.

Source of figures: [a] Lake Superior Iron Ore Association; [b] Bureau of Mines; [c] THE IRON AGE; [d] Bureau of the Census; [e] American Iron and Steel Institute; [f] National Association of Flat-Rolled Steel Manufacturers; [g] American Institute of Steel Construction; [h] United States Steel Corpn.; [i] United States Engineer, Pittsburgh; [k] When preliminary, from Automobile Manufacturers Association—Final figures from Bureau of the Census; [l] F. W. Dodge Corpn.; [m] *Railway Age;* [n] National Machine Tool Builders Association; [o] Foundry Equipment Manufacturers Association; [p] Department of Commerce; [r] British Iron and Steel Federation; [s] American Bureau of Metal Statistics; [t] American Zinc Institute, Inc.; [v] New York Commodities Exchange.

Steel Production Rises Four Points to 61 Per Cent Of Capacity—Six-Year High Equalled

Consumers' Rush to Cover Second Quarter Requirements at Price Concessions Is Partly Responsible for Gain—Many Mills Now Refusing Tonnage for March Delivery

THE placing of heavy orders for steel prior to the expected stabilization of prices in the second quarter has resulted in a four-point rise in steel production this week. At 61 per cent of capacity, current output is at as high a level as it has been since June, 1930, although mills operated at the same rate during the second week of June, 1934.

The summer bulge in output during 1934 occurred under circumstances not dissimilar to the current situation, as sharp price increases announced for third quarter forced heavy coverage at the old quotations. Under the code which was then in effect deliveries had to be completed by the end of a quarter.

While the current move to stabilize prices will result in only moderate increases and the deadline for the completion of shipments will not be enforced so rigidly, the sudden sharp acceleration in the upward trend of steel output can certainly not be attributed entirely to normal expansion in demand.

STEEL production this week is up seven points to 46 per cent at Pittsburgh, one-half point to 63½ per cent at Chicago, four points to 72 per cent in the Valleys, one point to 42 per cent at Philadelphia, nine points to 79 per cent at Cleveland, three points to 43 per cent at Buffalo and 10 points to 70 per cent in the Far West. Sheet, strip steel and bar mill operations are up sharply, as these products are most affected by second quarter price schedules.

THE second quarter price structure is now clearly defined. Alloy steel bars will be subject to quantity differentials similar to those applying on carbon bars and recent quotations on cold-finished carbon and alloy bars have been reaffirmed. Small consumers of all products on which differentials will apply are seeking to cover as many of their second quarter requirements as possible this month at reduced prices, but many mills are now booked to capacity on sheets and strip until April 1.

Moderate weather continues to inspire optimism in the automobile industry and tentative April production schedules are well above those in March. Finished steel releases are naturally heavier, and, in this case, changes in the price structure have not had a noticeable influence. Motor car builders will be able to avail themselves of the maximum quantity deductions and their reaction to the new system of discounts is believed to be favorable.

REPORTS of increased building activity are general and releases of structural steel, piling and reinforcing bars are uniformly heavier. New projects are also in larger volume, with private industrial jobs more numerous. At New York a resumption of small apartment construction has made itself felt. Federal funds are most noticeable in demand for highway steel and cast iron pipe.

Fabricated structural steel awards of the week total 31,750 tons, compared with 33,000 tons in the previous week. Highway bridges at Pittsburgh and Middletown, Conn., account for more than 17,000 tons of the current lettings. New projects calling for 19,525 tons are larger than the preceding week's total of 18,000 tons.

While railroad buying is less conspicuous than it was in the first two months of the year, sizable orders are still being placed and releases against old contracts are increasing. The Great Northern has awarded 500 ore cars and the Erie is in the market for 500 box and 300 automobile cars. The tentative program of the Chesapeake & Ohio calls for 5000 gondolas and 2000 cars of other types, but formal inquiry has not appeared. The New Haven is taking bids on 50 coaches.

THE scrap market has finally reflected the release of more plentiful supplies and shows signs of weakness despite increasing mill consumption. While THE IRON AGE composite price of No. 1 heavy melting steel, based on quotations at Pittsburgh, Chicago and Philadelphia, is unchanged at $14.75 a gross ton, heavy melting prices are lower at Detroit and Cleveland, where automotive scrap is more readily available.

Second quarter pig iron demand is developing slowly, but stabilization of steel prices has had a favorable effect on the market and large inquiries are beginning to appear. THE IRON AGE composite price of pig iron is holding at $18.84 a gross ton, and the finished steel composite is unchanged at 2.084c. a lb.

THE Senate hearings on the proposed Wheeler-Utterback anti-basing point bill have aroused some concern in the steel industry, as passage of the legislation would immediately necessitate widespread and costly readjustments. As pointed out at the hearings, the ultimate results would be highly discriminatory to small producers.

A Comparison of Prices

Market Prices at Date, and One Week, One Month, and One Year Previous; Advances Over Past Week in Heavy Type, Declines in Italics

Pig Iron

Per Gross Ton:	Mar. 17, 1936	Mar. 10, 1936	Feb. 18, 1936	Mar. 19, 1935
No. 2 fdy., Philadelphia	$21.3132	$21.3132	$21.3132	$20.26
No. 2, Valley furnace	19.50	19.50	19.50	18.50
No. 2 Southern, Cin'ti	20.2007	20.2007	20.2007	19.13
No. 2, Birmingham†	15.50	15.50	15.50	14.50
No. 2 foundry, Chicago*	19.50	19.50	19.50	18.50
Basic, del'd eastern Pa.	20.8132	20.8132	20.8132	19.76
Basic, Valley furnace	19.00	19.00	19.00	18.00
Malleable, Chicago*	19.50	19.50	19.50	18.50
Malleable, Valley	19.50	19.50	19.50	18.50
L. S. charcoal, Chicago	25.2528	25.2528	25.2528	24.04
Ferromanganese, seab'd carlots	75.00	75.00	75.00	85.00

†This quotation is for delivery in South; in the North prices are 38c. a ton under delivered quotations from nearest Northern furnace.

*The switching charge for delivery to foundries in the Chicago district is 60c. per ton.

Rails, Billets, etc.

Per Gross Ton:				
Rails, heavy, at mill	$36.37½	$36.37½	$36.37½	$36.37½
Light rails, Pittsburgh	35.00	35.00	35.00	35.00
Rerolling billets, Pittsburgh	28.00	28.00	29.00	27.00
Sheet bars, Pittsburgh	28.00	28.00	30.00	28.00
Slabs, Pittsburgh	28.00	28.00	29.00	27.00
Forging billets, Pittsburgh	35.00	35.00	35.00	32.00
Wire rods, Nos. 4 and 5, P'gh	38.00	38.00	40.00	38.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.	1.80	1.80	1.80	1.70

Finished Steel

Per Lb.:	Cents	Cents	Cents	Cents
Bars, Pittsburgh	1.85	1.85	1.85	1.80
Bars, Chicago	1.90	1.90	1.90	1.85
Bars, Cleveland	1.90	1.90	1.90	1.85
Bars, New York	2.20	2.20	2.20	2.13
Plates, Pittsburgh	1.80	1.80	1.80	1.80
Plates, Chicago	1.85	1.85	1.85	1.85
Plates, New York	2.09	2.09	2.09	2.08
Structural shapes, Pittsburgh	1.80	1.80	1.80	1.80
Structural shapes, Chicago	1.85	1.85	1.85	1.85
Structural shapes, New York	2.06¼	2.06¼	2.06¼	2.05¼
Cold-finished bars, Pittsburgh	2.10	2.10	2.10	2.10
Hot-rolled strips, Pittsburgh	1.85	1.85	1.85	1.85
Cold-rolled strips, Pittsburgh	2.60	2.60	2.60	2.60

Finished Steel

Per Lb.:	Mar. 17, 1936 Cents	Mar. 10, 1936 Cents	Feb. 18, 1936 Cents	Mar. 19, 1935 Cents
Hot-rolled annealed sheets, No. 24, Pittsburgh	2.40	2.40	2.40	2.40
Hot-rolled annealed sheets, No. 24, Gary	2.50	2.50	2.50	2.50
Sheets, galv., No. 24, P'gh	3.10	3.10	3.10	3.10
Sheets, galv., No. 24, Gary	3.20	3.20	3.20	3.20
Hot-rolled sheets, No. 10, P'gh	1.85	1.85	1.85	1.85
Hot-rolled sheets, No. 10, Gary	1.95	1.95	1.95	1.95
Wire nails, Pittsburgh	2.10	2.10	2.10	2.60
Wire nails, Chicago dist. mill	2.15	2.15	2.15	2.65
Plain wire, Pittsburgh	2.30	2.30	2.30	2.30
Plain wire, Chicago dist. mill	2.35	2.35	2.35	2.35
Barbed wire, galv., P'gh	2.50	2.50	2.50	3.00
Barbed wir, galv., Chicago dist. mill	2.55	2.55	2.55	3.05
Tin plate, 100 lb. box, P'gh	$5.25	$5.25	$5.25	$5.25

Scrap

Per Gross Ton:				
Heavy melting steel, P'gh	$15.75	$15.75	$14.75	$12.00
Heavy melting steel, Phila	13.75	13.75	13.75	10.25
Heavy melting steel, Ch'go	14.75	14.75	14.50	10.25
Carwheels, Chicago	14.00	14.00	14.00	11.00
Carwheels, Philadelphia	14.75	14.75	14.75	11.75
No. 1 cast, Pittsburgh	15.25	15.25	14.25	12.75
No. 1 cast, Philadelphia	14.25	14.25	13.00	11.00
No. 1 cast, Ch'go (net ton)	13.00	13.00	13.00	9.50
No. 1 RR. wrot., Phila	13.25	13.25	13.25	10.75
No. 1 RR. wrot., Ch'go (net)	13.25	13.25	13.25	8.00

Coke, Connellsville

Per Net Ton at Oven:				
Furnace coke, prompt	$3.65	$3.65	$3.65	$3.85
Foundry coke, prompt	4.25	4.25	4.25	4.60

Metals

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Electrolytic copper, Conn.	9.25	9.25	9.25	8.75
Lake copper, New York	9.37½	9.37½	9.37½	9.12½
Tin (Straits), New York	48.25	48.30	47.75	45.50
Zinc, East St. Louis	4.90	4.90	4.85	3.90
Zinc, New York	5.27½	5.27½	5.22½	4.25
Lead, St. Louis	4.45	4.45	4.35	3.45
Lead, New York	4.60	4.60	4.50	3.60
Antimony (Asiatic), N. Y.	13.50	13.25	12.87½	14.50

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

The Iron Age Composite Prices

	Finished Steel	Pig Iron	Steel Scrap
March 17, 1936	2.084c. a Lb.	$18.84 a Gross Ton	$14.75 a Gross Ton
One week ago	2.084c.	18.84	14.75
One month ago	2.109c.	18.84	14.33
One year ago	2.124c.	17.90	10.83

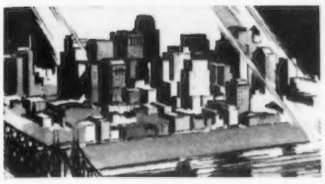
Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strips. These products represent 85 per cent of the United States output.

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

	Finished Steel High	Finished Steel Low	Pig Iron High	Pig Iron Low	Steel Scrap High	Steel Scrap Low
1936	2.130c., Jan. 7	2.084c., Mar. 10	$18.84, Jan. 7	$18.84, Jan. 7	$14.75, Feb. 25	$13.33, Jan. 7
1935	2.130c., Oct. 1	2.124c., Jan. 8	18.84, Nov. 5	17.83, May 14	13.42, Dec. 10	10.33, April 23
1934	2.199c., April 24	2.008c., Jan. 2	17.90, May 1	16.90, Jan. 27	13.00, Mar. 13	9.50, Sept. 25
1933	2.015c., Oct. 3	1.867c., April 18	16.90, Dec. 5	13.56, Jan. 3	12.25, Aug. 8	6.75, Jan. 3
1932	1.977c., Oct. 4	1.926c., Feb. 2	14.81, Jan. 5	13.56, Dec. 6	8.50, Jan. 12	6.43, July 5
1931	2.037c., Jan. 13	1.945c., Dec. 29	15.90, Jan. 6	14.79, Dec. 15	11.33, Jan. 6	8.50, Dec. 29
1930	2.273c., Jan. 7	2.018c., Dec. 9	18.21, Jan. 7	15.90, Dec. 16	15.00, Feb. 18	11.25, Dec. 9
1929	2.317c., April 2	2.273c., Oct. 29	18.71, May 14	18.21, Dec. 17	17.58, Jan. 29	14.08, Dec. 3
1928	2.286c., Dec. 11	2.217c., July 17	18.59, Nov. 27	17.04, July 24	16.50, Dec. 31	13.08, July 2
1927	2.402c., Jan. 4	2.212c., Nov. 1	19.71, Jan. 4	17.54, Nov. 1	15.25, Jan. 11	13.08, Nov. 22

Steel Output Sharply Increased at Pittsburgh



Production Up Seven Points to 46 Per Cent as Valley Rate Jumps Four Points to 72 Per Cent—Wheeling District Holding

PITTSBURGH, March 17.—With consumers of semi-finished, sheets and strip steel pushing mills for delivery before the end of the first quarter, and with the appearance of automotive buying on a larger scale, ingot output in the Pittsburgh district has been boosted seven points to 46 per cent of capacity. Production in the Valleys and nearby northern Ohio mills has increased four points to 72 per cent of capacity, while operations in the Wheeling district continue unchanged at 80 per cent.

The innovation of quantity deductions and extras and an open price practice in the selling of sheets, strip and bars are expected by producers to result in firmer quotations for the coming quarter. It is the apparent intention of steel manufacturers in this district to go along with the open price policy announced by a leading producer in the Cleveland district.

While some of the present increase in production is probably attributable to consumers taking advantage of recent price concessions, there is evidence that the increase in tonnage from automobile makers is for immediate consumption.

Influx of orders from car makers and miscellaneous consumers has resulted in an eight-point rise in sheet production to 73 per cent, and a 10-point advance in strip steel to 60 per cent. Some mills have notified their customers that further orders for first quarter delivery will be unacceptable.

Tin plate activity continues unchanged at 75 per cent of capacity.

Current quotations of 2.10c., Pittsburgh, for cold-finished bars and shafting have been reaffirmed for second quarter. Cold drawn alloy steel bars are also unchanged at 2.95c., Pittsburgh.

Pig Iron

With the reaffirmation of first quarter prices and producers occupied in filling spot lot orders, this market continues dull. Scarcity of inquiries for the coming quarter indicates no hurry on the part of consumers to place contracts.

Semi-Finished Steel

With firmer prices definitely in the picture for the second quarter, volume of business in semi-finished steel has picked upon considerably during the past week. There has been increased movement to strip manufacturers, who are being pushed to complete specifications entered at low prices during the first quarter. Shipments of sheet bars to non-integrated sheet and tin plate mills are steady.

Bolts, Nuts and Rivets

Current quotations have been reaffirmed for second quarter delivery and specifications continue in good volume. A further slight improvement is discernible in demand from automotive interests. Miscellaneous business is showing up well and quite a few customers not heard from for some time are making their appearance. Breaking up of the recent sub-freezing weather followed by higher temperatures is expected to bring out a better volume of motor car building, and as a result continued improvement in buying is expected.

Bars

Indications during the past week point very definitely to the fact that resumption of automobile buying on a larger scale is here. Tonnage for miscellaneous business continues in steady volume. The change in the quantity brackets in the pricing of hot-rolled bars is expected to stabilize this market. It is understood that producers, on the whole, will adhere to the policy outlined by a leading manufacturer, namely, that when and if any change in price is made, consumers will be promptly notified.

Reinforcing Steel

Although second quarter prices have not been announced as yet, it is assumed that first quarter prices will rule for the coming quarter. Meanwhile, formal quotations are expected momentarily. Anticipation by the trade of a firmer price situation is responsible for the continuation of the recent improvement in demand. The tendency of the weather to open up is also exerting its influence on the amount of tonnage being received.

Cold-Finished Bars

Current quotations of 2.10c., Pittsburgh, for cold-finished bars and shafting have been reaffirmed for second quarter delivery. Cold drawn alloy steel bars have also been reaffirmed at 2.95c., Pittsburgh. Specifications from the automotive industry are coming in at a much better rate, with the result that demand in this market is showing a sharp improvement over the past week. It is understood that the recent absence of a large volume of automobile orders was due to the fact that the motor car people were unable to move completed cars on account of cold weather blocking and making main highways hazardous. Every bit of available storage had been filled with finished products, and now that the weather has opened up stocks are being reduced and the manufacturers are able to go ahead with their production plans. Unclassified tonnage continues in steady volume.

Sheet Steel Piling

Although present quarter prices have not been officially reaffirmed, it is assumed that they will rule in the coming period. Bidding is in progress on the All-American Canal at Potholes, Cal., on a piecemeal basis, the average being 50 to 100 tons per bid. Total piling requirements approximate 1400 to 1500 tons. The project is under the supervision of the Bureau of Reclamation.

Plates and Shapes

While railroad car builders have not as yet come into the market strongly for plates, it is expected that with the coming of milder weather specifications will be released. The Dravo Contracting Co. has been awarded a contract for a dredge for the War Department, involving about 600 tons of plates.

This week's structural inquiries are featured by three private projects, amounting to about 1300 tons. Final approval has been received by American Bridge Co. to begin fabricating for the High Level bridge at Homestead, Pa., an Allegheny County Authority project, requiring 8120 tons. A contract involving 850 tons for a building for the Aluminum Co. of America at New Kensington, Pa., has been awarded to Fort Pitt Bridge Works Co. A plant addition for the Viscose Co. at Meadville, Pa., taking 3650 tons, has been awarded to the Bethlehem

Steel Corpn. Public works jobs comprise the balance of the list.

Approximately 100 tons of wrought iron plates will be used for a ceiling to be built over each of the four sets of tracks at the Pittsburgh Federal building and post office. Since the building was finished considerable damage has occurred, due to smoke and steam from locomotives.

Rails and Track Accessories

Current quotations have been reaffirmed for second quarter delivery. The local rail mill is engaged on tonnage on the Chesapeake & Ohio rail order, and later this week will probably begin production on a portion of the Norfolk & Western order.

Tubular Products

Aside from the steady flow of specifications in oil-country goods, there is little activity in this market. Producers have placed their hopes in the possibility that an improvement in building construction will be brought about. Current quotations on wrought iron pipe have been reaffirmed for second quarter.

Wire Products

Demand in this market continues fairly active, with no unusual tonnage being placed following the recent announcement of second quarter prices. There is indication that a firmer price situation will prevail in the second quarter. Quite a few consumers, anticipating that quotations would be generally strengthened, had placed specifications a week or two previous to the formal price announcement.

Sheets

Expansion of orders from motor car builders and the intention of other buyers to get delivery before second quarter has resulted in an eight-point rise in sheet production to 73 per cent. There has been a noticeable increase in tonnage from drum manufacturers and refrigerator makers. While some of this increase is attributable to efforts of consumers to benefit by recent low prices, nevertheless the tonnage from automotive sources is believed to be for immediate consumption. There is a probability that producers will be unable soon to accept further orders for first quarter delivery.

Tin Plate

Tin plate production remains at about 75 per cent of capacity, with general line cans constituting the bulk of specifications. There is, however, evidence that packers' requirements will be forthcoming soon. Orders for "beer plate" have also made their appearance. Meanwhile, the aggregate demand continues steady.

Strip Steel

Anticipation of firmer prices and added signs of an early resumption of automotive buying on a larger scale have boosted hot-rolled strip operations 10 points to 60 per cent. The new innovation in the selling of strip steel, namely, quantity differentials and the signification to customers that any change in prices will be promptly published, is expected by producers to put an end to the softness prevalent in this market during the first quarter. The $3 deduction is applicable to 100 tons and over for cold-rolled strip, while on hot-rolled this deduction applies on orders of 150 tons and over. At the rate specifications against recent low-price concessions are coming in, there is a distinct possibility that some mills will be forced to turn down orders for first quarter delivery.

Coal and Coke

Continued mild weather and seasonal influences are responsible for the low ebb in coal and coke. Domestic users are practically out of the market, having stocked up liberally during the recent cold spell. Slow movement of large lump has resulted in a paring down of slack accumulations. Demand is expected to continue dull until movement to the Lakes and to cement manufacturers begins. Much greater tonnage is expected to go to the Lakes this year on account of the severe weather experienced in the Northwest. It is understood that dock supplies have practically disappeared.

Scrap

Although the weather has cleared and there are signs of more scrap coming out, the $16 price for No. 1 heavy melting steel is holding. One consumer is reported to be out of the market temporarily. Conditions generally are very quiet this week, and brokers are able to cover their short orders a little more easily. Meanwhile, the market seems to be marking time awaiting future developments.

Steel Production Is Higher at Buffalo

BUFFALO, March 17.—The tone of the pig iron market has improved considerably, although furnaces are having difficulty cleaning up first quarter contracts. Several inquiries for lots ranging from 1000 to 2000 tons have appeared. The Republic Steel Corpn. has blown in a second furnace which previously had been banked.

The market for old material is very strong. It is estimated that the largest district consumer in its purchases mentioned last week, acquired between 7000 and 10,000 tons of scrap. While the order was officially for No. 1 heavy melting steel, many dealers will ship bundles at the stated differentials. The market is firm and dealers are not anxious to sell at present prices. The sale reported last week was at $13.50. No. 1 machinery cast and cupola cast grades are stronger; a sale of stove plate was made at $11.50. There is very little scrap in dealers' yards and the flow of material from this city and district to Ohio points continues.

Steel mill operations have improved. Bethlehem Steel Corpn.'s Lackawanna plant is operating 14

Weekly Indications of Steel Activity

From THE IRON AGE

	Mar. 17, 1936	Mar. 10, 1936	Feb. 18, 1936	Mar. 19, 1935	Average Year to Date 1936	Average Year to Date 1935
Steel ingot operations—Per cent of capacity	61.0	57.0	53.5	47.0	53.4	50.7

	Week Ended Mar. 17, 1936	Mar. 10, 1936	Feb. 18, 1936	Mar. 19, 1935	Year to Date 1936	Year to Date 1935
Fabricated structural steel awards	31,060	33,000	32,215	45,800	254,535	176,155
Fabricated plate awards	1,525	8,720	1,945	1,425	75,912	50,515
Sheet steel piling awards	0	0	0	916	14,045	5,216
Reinforcing bar awards	2,060	14,615	3,100	7,800	107,065	66,440

open-hearths. This plant rolled a portion of the recent 11,000-ton New York Central rail order and is now rolling billets. Seneca sheet division of Bethlehem is operating at 75 per cent and the new cold sheet and strip mill is being prepared for production about May 1. Republic Steel Corpn. is operating three open-hearths and Wickwire-Spencer Corpn. one.

A new cell block for Attica prison will require 400 to 500 tons of structural steel, according to preliminary estimates.

Canadian Steel Orders Expanding Rapidly

TORONTO, ONT., March 16.—New business continues to appear in good volume in the Canadian iron and steel markets, and plant operations are showing further improvement. Steel mills are maintaining high operating schedules, while other plants associated with the industry are running at the highest level in several years. Book orders carried over from 1935 are heavy and spot sales are increasing with demand calling for a widely diversified list of materials.

The automotive industry is responsible for large sheet orders as well as for bolts, nuts, screws, castings, etc., and the agricultural implement branch is taking larger quantities of raw materials. Exports of farm implements and machinery for January this year totaled $416,168, compared with $22,966 for January, 1935.

Improvement also is reported in demand for structural steel. Dominion Bridge Co. has secured contract for head frames and grating platforms for Lake Shore Mines, which will give the company work for several months. The Dominion Bridge Co. also has been awarded contract for steel for power house for Goderich Salt Co., involving about 100 tons.

In the merchant pig iron markets new business is appearing at a good rate, with individual orders ranging from 50 to 200 tons. Awards for the past week are said to have jumped to close to 1400 tons, but this was due to several melters placing orders for spot delivery to carry them through the current quarter. Inquiries are said to have appeared for second quarter delivery, but booking is slow.

The daily melt is holding in excess of 50 per cent of capacity and local blast furnace representatives look for further increases in this direction in the early Spring. At present five blast furnaces are blowing and production is running somewhat ahead of January and February,

For January, production totaled 61,336 long tons, or 13 per cent under the 70,647 tons reported for December. Decline for the month was in basic and malleable iron, foundry showing a substantial increase.

Deliveries of iron and steel scrap to consumers again are going forward on schedule and local dealers state that the demand in some grades is steadily expanding. Shipments of heavy melting steel to the mills in the Hamilton district are fairly heavy, while other consumers throughout Ontario and Quebec also are showing more interest in the scrap markets. With foundry operations increasing, demand for iron grades is showing improvement. No. 1 machinery cast is in good demand, but dealers state that holdings are light and some consumers are bringing scrap down from the northern sections to take care of their needs.

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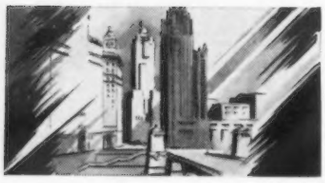
Production at Chicago Rises Only Moderately



Ingot Output Is Up to 63½ Per Cent as Demand from Practically All Consuming Channels Increases

CHICAGO, March 17. — Sales and specifications are above weekly averages for the year thus far, but the operating gain is only mild in comparison. The ingot rate is up half a point to 63½ per cent. Further improvement is in prospect, however, as virtually all consumers appear to be stepping up schedules.

While automotive production has increased, demand from that industry has not picked up correspondingly, but can be expected to show a sizable gain shortly. Nevertheless, the improvement registered to date, together with new orders from miscellaneous users, has helped to stabilize sheet prices.

Railroad specifications cover rails, accessories, plates, bars and other items, and schedules of all producing units have been accelerated. The largest rail order pending is that of the Rock Island, this amounting to 28,000 tons. Scattered small-lot orders are in prospect.

Additional freight-car buying through the year is foreseen as a result of the demand for high speeds to which some of the existing equipment is unequal. The Great Northern has ordered 500 ore cars from the American Car & Foundry Co.

Warehouse Business

Warehouses have applied quantity differentials to common wire nails and cement-coated nails. Prices for each (per keg of 100 lb.) are: one to 14 kegs, 2.65c.; 15 to 19 kegs, 2.45c., and 50 kegs, 2.40c.

Pig Iron

This commodity has benefited psychologically from the stability given to the steel market by second quarter price announcements. Large customers who had been waiting for a price settlement in steel to clarify the atmosphere again are in the market and have placed attractive tonnages. The automotive as well as building supply industry has been more liberal with shipping orders. Contract deliveries are increasing daily, indicating that March will continue the improvement shown thus far over the corresponding period in February. Larger coke tonnages are being taken at foundries, this being in line with a reported increase in the melt.

Cast Iron Pipe

Makers of this material report demand as somewhat better. The business includes tonnages that were anticipated under contracts awarded last fall. Both Government and municipal projects are represented in the new order list. Some of the tonnages originated in Michigan. A number of extensions to municipal water systems are contemplated in Indiana and Wisconsin. Yet these States to date have been backward with such work. A spring demand slightly better than seasonal is anticipated from a combination of new projects and replacements of existing equipment necessitated by cold weather damage.

Reinforcing Bars

New business is developing for the immediate future and current orders have been sufficient to maintain existing prices. While producer reports vary as to the volume of tonnage released, there is agreement that the market has safely passed the stage where price weakness is likely to develop, at least until the end of the first half. Approximately 500 tons is involved in a number of Illinois bridge projects near the contract stage. A paving project in Cook County, Ill., will take 100 tons and the Sanitary District of Chicago is to be in the market shortly for close to 1000 tons for new work. A sewer project in the Minneapolis-St. Paul district will take a possible 800 tons.

Wire Products

Demand that had backed up during the cold weather is now being released and this, together with an improvement in current business, has necessitated a slight increase in production schedules. Still further expansion is foreseen. A noticeable pick-up in orders for manufacturers' wire followed an increase in automobile assemblies. Proportionate gains also are shown for other industries. Second quarter prices appear to be reasonably well established, although there are revisions yet to be made on a number of items.

Plates

Some new business is shown in sales reports, but comparatively little of the improvement can be traced to railroad account. The Great Northern is reported to have closed on an inquiry for 500 freight cars and awards are expected momentarily on 3000 refrigerator cars from the Pacific Fruit Express Co. Additional equipment buying from earnings is expected throughout the year. This follows a competitive demand for high speeds which some of the existing equipment cannot stand. Specifications under previously booked orders have necessitated a step-up in rolling schedules.

Bars

Producing schedules have been accelerated under an increase in sales and specifications. Much of the improvement is traced to a better demand from miscellaneous users. At the same time, automotive demand has improved moderately, while orders from the tractor and farm implement industry and road machinery makers continue in large volume. Operations of farm implement consumers are well sustained, as is evidenced by a retail demand much larger than that of the corresponding period last year.

Structural Material

Fabricating shops have expanded operations in order to supply a larger demand for public works' needs. Private building requirements still are small, although that field continues to expand as a possible outlet. Awards of 3350 tons cover requirements of public buildings, and heavy engineering projects, mostly in the public works category. Projects of similar character are represented in the list of inquiries aggregating 5510 tons.

Sheets

Producers say that all of the recent price weakness will have disappeared by the end of the current week. Books have been opened for second quarter and some attractive tonnages have been placed. Specifications in larger volume have resulted in increased production. Automotive demand has yet to reach the proportions expected for it in view of the step-up in assemblies, although a gradual increase in the tonnage from that consumer is

looked for from now on through at least the greater part of the second quarter. Miscellaneous orders account for some of the current improvement.

Rails

All rail and accessory producing schedules have been enlarged under an increase in specifications against recently announced orders, but no new awards have been made. There are still a few scattered rail tonnages in prospect, but as yet none of these have reached the inquiry stage. The largest order pending is that of the Rock Island, amounting to 28,000 tons, together with required accessories.

Scrap

This market continues to reflect the upward trend of mill operations, although the improvement is largely evidenced in a stronger undertone. Prices remain quotably unchanged from those previously reported. The last sale was that of approximately 25,000 tons of heavy melting to a mill consumer at $15. This confirms the existing quotations on that and companion grades, such as shoveling steel and No. 2 railroad wrought. More scrap is coming into the territory, and mills have thus been assured of an adequate supply for the current bulge. A result of the recent shortage in the supply is noticed in complaints of a few of the smaller producers that they are now short of raw steel.

Ohio River Sheet Mills Well Booked

CINCINNATI, March 17.—Lack of price stimulus is apparently retarding heavy second quarter pig iron buying. Melters are neither in the market for substantial quantities of iron nor are they indicating interest by way of inquiry. Furnace representatives report demand in the past weeks slightly greater than in the preceding period, but the increase is not sufficient to show a trend toward heavy covering. The brisk rate of shipments presages small danger of cancellation or rewriting of many contracts on the first, since melters appear to be taking all the iron ordered. Slight improvement is reported in the foundry operations as machine tool and stove interests increase production.

Sheet steel demand in this district swelled to about 90 per cent of mill capacity last week, with the leading interest booking full tonnage in its units. Speculative purchasing is totally absent, and, although books for second quarter are now open, buyers are conservative. Prices have been announced by the leading interest subject to quantity differentials. Rolling schedules are on a parity with demand. The leading interest, however, is refusing further orders for first quarter delivery on cold-rolled, galvanized and long terne sheets because capacity for these products is booked solidly for the remainder of this quarter.

The scrap market appears sensitive to any trade influence. While current bookings are for scattered tonnages of needed material, prices are being maintained and appear ready to move upward with any substantial buying move. Yard stocks are in good shape and dealers are cultivating a steady strong undertone.

Jobbers demand is moving moderately upward under stimulus from building projects. Industrial business is being maintained.

"A.W." ROLLED STEEL FLOOR PLATE

Standard Diamond pattern shown actual size.

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SAFETY AND PERMANENCE AT LOW COST

—for traffic treads on approaches and floors of bridges, at road crossings. For platforms, stair treads, catwalks, etc. For new construction, replacement or repair of industrial floors (laid right over worn old floors). Immediate delivery in various patterns to meet all requirements.

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AUTOMATIC CONTROL *for* CRANES • MILL DRIVES *and* MACHINERY
BRAKES • LIMIT STOPS *and* LIFTING MAGNETS.

Detroit Scrap Prices Decline Slightly

DETROIT, March 17.—The scrap market is easing off as steel mills fail to sustain buying in the face of rising operations. Sudden release of metal from yards created a feeling of oversupply but brokers feel that mills lack large reserves and must enter the market strongly in the near future.

Criticizes Social Security Act

PROPHECY that the old age reserve account of the Social Security Act may be used in 1965 to liquidate the national debt or a great part of it was made last Tuesday by M. A. Linton, president, Provident Mutual Life Insurance Co., Philadelphia, one of the actuarial advisers of Congress in framing old-age pension and unemployment insurance legislation. By that time, Mr. Linton said, the reserve fund will have approximated $37,000,000,000. He made this statement when addressing a meeting of the Cincinnati branch of the National Metal Trades Association.

The speaker pointed out the danger of having such a vast sum made the football of partisan politics. He said he believed it was in the minds of the framers of the act to safeguard the fund, year by year, by investing it in direct obligations of the United States which could be used later to retire the national debt.

He said it was a matter of common knowledge among actuaries that the old age reserve account never would have to be liquidated, and that it was the theory that pensions and retirement allowances would be paid from the income of the fund which would amount to more than $1,000,000,000 a year on the 3 per cent investment basis provided for in the act.

Speaking of the unemployment insurance future, Mr. Linton said that if there was a severe depression in 1960 the unemployment insurance reserves would be exhausted in short order. He pointed out also that the law specifies that unemployment reserves can be paid back only as benefits, so that if the law should be declared unconstitutional after a few years there would be no way for taxpayers, either employers or employees, to recover what they had paid in.

The law was passed in a "half baked" state, he said, while actuaries and other consultants urged in vain that Congress wait a year until it could be studied. He expressed the opinion that the law would be declared unconstitutional.

Officers elected by the Metal Trades Association were Leroy Brooks, Jr., president; Richard E. LeBlond, vice-president; Warner Atkins, treasurer; O. E. Schauer, secretary, and E. D. Tribbet, H. T. Simpson and Charles Meier, executive committee members.

Mesta to Get New J. & L. Strip Mill

THE Jones & Laughlin Steel Corpn., in an amendment to its registration statement, filed with the SEC in Washington, indicated that the Mesta Machine Co. will receive the contract for the rolling mill equipment for its $25,000,000 continuous wide strip mill. It was indicated that the General Electric Co. will get the generating equipment business. No contracts have yet been executed, although the commitments have been made with Mesta and General Electric for preliminary work and tentative understandings have been reached with those companies for the rolling mill equipment and for certain generating equipment.

Jones & Laughlin also said that the names of companies with whom financial contracts have been made for materials and equipment in connection with the construction of the electrically controlled $5,000,000 blooming mill, which is practically completed, are Mesta Machine Co., Mackintosh-Hemphill Co., General Electric Co., Morgan Engineering Co., Treadwell Engineering Co., Surface Combustion Co., and Morgan Construction Co.

Carnegie-Illinois Steel Corpn. and American Sheet & Tin Plate Co. have consolidated their advertising activities, with headquarters in the Carnegie Building, Pittsburgh. The consolidated department is under the direction of C. R. Moffatt, advertising manager, G. R. Schreiner, assistant advertising manager, and H. V. Jamison, assistant advertising manager.

The St. John X-ray Service, Inc., will conduct two practical training courses in metal radiography in its laboratory, 30-20 Thomson Avenue, Long Island City, N. Y., during the summer. The first will be held for those attending the meetings of the American Society for Testing Materials during the week of July 6 and the other during the week of July 13.

Prices of Finished Steel and Iron Products

BARS, PLATES, SHAPES

Iron and Steel Bars

Soft Steel	*Base per Lb.*
F.o.b. Pittsburgh	1.85c.
F.o.b. Chicago	1.90c.
F.o.b. Gary	1.90c.
F.o.b. Duluth	2.00c.
Del'd Detroit	2.00c.
F.o.b. Cleveland	1.90c.
F.o.b. Buffalo	1.95c.
Del'd Philadelphia	2.16c.
Del'd New York	2.20c.
F.o.b. Birmingham	2.00c.
F.o.b. cars dock Gulf ports	2.25c.
F.o.b. cars Pacific ports	2.40c.

Rail Steel

(For merchant trade)

F.o.b. Pittsburgh	1.70c.
F.o.b. Chicago	1.75c.
F.o.b. Gary	1.75c.
F.o.b. Moline, Ill.	1.75c.
F.o.b. Cleveland	1.75c.
F.o.b. Buffalo	1.80c.
F.o.b. Birmingham	1.85c.
F.o.b. cars dock Gulf ports	2.10c.
F.o.b. cars dock Pacific ports	2.25c.

Billet Steel Reinforcing

(Straight lengths as quoted by distributors)

F.o.b. Pittsburgh	2.05c.
F.o.b. Chicago	2.10c.
F.o.b. Gary	2.10c.
Del'd Detroit	2.20c.
F.o.b. Cleveland	2.10c.
F.o.b. Youngstown	2.10c.
F.o.b. Buffalo	2.10c.
F.o.b. Birmingham	2.10c.
F.o.b. cars dock Gulf ports	2.45c.
F.o.b. cars dock Pacific ports	2.45c.

Rail Steel Reinforcing

(Straight lengths as quoted by distributors)

F.o.b. Pittsburgh	1.90c.
F.o.b. Chicago	1.95c.
F.o.b. Gary	1.95c.
F.o.b. Cleveland	1.95c.
F.o.b. Youngstown	1.95c.
F.o.b. Buffalo	1.95c.
F.o.b. Birmingham	1.95c.
F.o.b. cars dock Gulf ports	2.30c.
F.o.b. cars dock Pacific ports	2.30c.

Iron

F.o.b. Chicago	1.80c.
F.o.b. Pittsburgh (refined)	2.10c.
Delivered New York	2.05c.
Delivered Philadelphia	2.10c.

Cold Finished Bars and Shafting*

	Base per Lb.
F.o.b. Pittsburgh	2.10c.
F.o.b. Chicago	2.15c.
F.o.b. Gary	2.15c.
F.o.b. Cleveland	2.15c.
F.o.b. Buffalo	2.20c.
Del'd Detroit	2.30c.
Del'd eastern Michigan	2.35c.

* In quantities of 10,000 to 19,999 lb.

Fence and Sign Posts

Angle Line Posts

	Base per Net Ton
F.o.b. Pittsburgh	$54.00
F.o.b. Chicago	54.00
F.o.b. Duluth	55.00
F.o.b. Cleveland	54.00
F.o.b. Birmingham	57.00
F.o.b. Houston, Orange, Beaumont, Galveston	63.00
F.o.b. Mobile	62.00
F.o.b. New Orleans, Lake Charles, Corpus Christi	63.00
F.o.b. cars dock Pacific ports	67.00

Plates

	Base per Lb.
F.o.b. Pittsburgh	1.80c.
F.o.b. Chicago	1.85c.
F.o.b. Gary	1.85c.
Del'd Cleveland	1.995c.
F.o.b. Coatesville	1.90c.
F.o.b. Sparrows Point	1.90c.
Del'd Philadelphia	1.99c.
Del'd New York	2.09c.
F.o.b. Birmingham	1.95c.
F.o.b. cars dock Gulf ports	2.20c.
F.o.b. cars dock Pacific ports	2.35c.
Wrought iron plates, f.o.b. P'gh	3.20c.

Floor Plates

F.o.b. Pittsburgh	3.35c.
F.o.b. Chicago	3.40c.
F.o.b. Coatesville	3.45c.
F.o.b. cars dock Gulf ports	3.75c.
F.o.b. cars dock Pacific ports	3.90c.

Structural Shapes

	Base per Lb.
F.o.b. Pittsburgh	1.80c.
F.o.b. Chicago	1.85c.
Del'd Cleveland	1.995c.
F.o.b. Buffalo	1.90c.
F.o.b. Bethlehem	1.90c.
Del'd Philadelphia	2.015c.
Del'd New York	2.0625c.
F.o.b. Birmingham (standard)	1.95c.
F.o.b. cars dock Gulf ports	2.20c.
F.o.b. cars dock Pacific ports	2.35c.

Steel Sheet Piling

	Base per Lb.
F.o.b. Pittsburgh	2.15c.
F.o.b. Chicago	2.25c.
F.o.b. Buffalo	2.25c.
F.o.b. cars dock Gulf ports	2.60c.
F.o.b. cars dock Pacific ports	2.60c.

SHEETS, STRIP, TIN PLATE TERNE PLATE

Sheets

Hot Rolled

	Base per Lb.
No. 10, f.o.b. Pittsburgh	1.85c.
No. 10, f.o.b. Gary	1.95c.
No. 10, del'd Detroit	2.05c.
No. 10, del'd Phila.	2.16c.
No. 10, f.o.b. Birmingham	2.00c.
No. 10, f.o.b. cars dock Pacific ports	2.40c.

Hot-Rolled Annealed

No. 24, f.o.b. Pittsburgh	2.40c.
No. 24, f.o.b. Gary	2.50c.
No. 24, del'd Detroit	2.45c. to 2.60c.
No. 24, del'd Phila.	2.71c.
No. 24, f.o.b. Birmingham	2.55c.
No. 24, f.o.b. cars dock Pacific ports	3.05c.
No. 24, wrought iron, Pittsburgh	4.30c.

Heavy Cold-Rolled

No. 10 gage, f.o.b. Pittsburgh	2.50c.
No. 10 gage, f.o.b. Gary	2.60c.
No. 10 gage, f.o.b. Detroit	2.55c. to 2.70c.
No. 10 gage, del'd Phila.	2.81c.
No. 10 gage, f.o.b. Birmingham	2.65c.
No. 10 gage, f.o.b. cars dock Pacific ports	3.10c.

Light Cold-Rolled

No. 20 gage, f.o.b. Pittsburgh	2.95c.
No. 20 gage, f.o.b. Gary	3.05c.
No. 20 gage, del'd Detroit	3.00c. to 3.15c.
No. 20 gage, del'd Phila.	3.26c.
No. 20 gage, f.o.b. Birmingham	3.10c.
No. 20 f.o.b. cars dock Pacific ports	3.50c.

Galvanized Sheets

No. 24 gage, f.o.b. Pittsburgh	3.10c.
No. 24, f.o.b. Gary	3.20c.
No. 24, del'd Phila.	3.41c.
No. 24, f.o.b. Birmingham	3.25c.
No. 24, f.o.b. cars dock Pacific ports	3.70c.
No. 24, wrought iron, Pittsburgh	4.95c.

Long Ternes

No. 24, unassorted 8-lb. coating f.o.b. Pittsburgh	3.40c.
F.o.b. Gary	3.50c.
F.o.b. cars dock Pacific ports	4.10c.

Vitreous Enameling Stock

No. 20, f.o.b. Pittsburgh	2.95c.
No. 20, f.o.b. Gary	3.05c.
No. 20, f.o.b. Birmingham	3.55c.
No. 20, f.o.b. cars dock Pacific ports	3.55c.
No. 10, f.o.b. Pittsburgh	2.35c.
No. 10, f.o.b. Gary	2.45c.
No. 10, f.o.b. Birmingham	2.95c.
No. 10, f.o.b. cars dock Pacific ports	2.95c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh	2.75c.
No. 28, Gary	2.85c.
No. 28, cars dock Pacific Coast ports	3.35c.

Tin Plate

	Base per Box
Standard cokes, f.o.b. P'gh district mill	$5.25
Standard cokes, f.o.b. Gary	5.35
Standard cokes, f.o.b. cars dock Pacific ports	5.90

Terne Plate

(F.o.b. Pittsburgh)

(Per Package, 20 x 28 in.)

8-lb. coating I.C.	$10.00
15-lb. coating I.C.	12.00
20-lb. coating I.C.	13.00
25-lb. coating I.C.	14.00
30-lb. coating I.C.	15.25
40-lb. coating I.C.	17.50

Hot-Rolled Hoops, Bands, Strips and Flats under ¼ In.

	Base per Lb.
All widths up to 24 in., P'gh	1.85c.
All widths up to 24 in., Chicago	1.95c.
All widths up to 24 in., del'd Detroit	2.05c.
All widths up to 24 in., Birmingham	2.00c.
Cooperage stock, Pittsburgh	1.95c.
Cooperage stock, Chicago	2.05c.

Cold-Rolled Strips

	Base per Lb.
F.o.b. Pittsburgh	2.60c.
F.o.b. Cleveland	2.60c.
Del'd Chicago	2.895c.
F.o.b. Worcester	2.80c.

Fender Stock

No. 14, Pittsburgh or Cleveland	2.90c.
No. 14, Worcester	3.30c.
No. 20, Pittsburgh or Cleveland	3.30c.
No. 20, Worcester	3.70c.

WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh and Cleveland.)

To Manufacturing Trade	*Per Lb.*
Bright wire	2.30c. to 2.40c.
Spring wire	2.90c. to 3.05c.

Chicago prices on products sold to the manufacturing trade are $1 a ton above Pittsburgh or Cleveland. Worcester and Duluth prices are $2 a ton above, Birmingham $3 above, and Pacific Coast prices $9 a ton above Pittsburgh or Cleveland.

To the Trade	*Base per Keg*
Standard wire nails	$2.10
Smooth coated nails	2.10

	Base per 100 Lb.
Annealed fence wire	$2.45 to $2.65
Galvanized fence wire	2.80 to 3.00
Polished staples	2.80
Galvanized staples	3.05
Barbed wire, galvanized	2.60
Twisted barbless wire	2.60
Woven wire fence, base column	58.00
Single loop bale ties, base column	51.00

Chicago and Anderson, Ind., mill prices are $1 a ton over Pittsburgh base (on all products except woven wire fence, for which the Chicago price is $2 above Pittsburgh); Duluth, Minn., mill prices are $2 a ton over Pittsburgh except for woven wire fence, which is $3 over Pittsburgh, and Birmingham mill prices are $3 a ton over Pittsburgh.

On wire nails, barbed wire and staples, prices at Houston, Galveston and Corpus Christi, Tex., New Orleans, Lake Charles, La., and Mobile, Ala., are $6 a ton over Pittsburgh.

On nails, staples and barbed wire, prices of $6 a ton above Pittsburgh are also quoted at Beaumont and Orange, Tex.

STEEL AND WROUGHT IRON PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

F.o.b. Pittsburgh only on wrought iron pipe.

Butt Weld

Steel Inches	Steel Black	Steel Galv.	Wrought Iron Inches	Wrought Iron Black	Wrought Iron Galv.
⅛	57	37	⅛	...+91½	+138
¼ to ⅜	...60	44½	¼ & ⅜	+1½	+21½
½	.....64½	55	½	....31½	15
¾	.....67½	59	¾	.....36½	20½
1 to 3	.....69½	61½	1 & 1¼	.39½	25½
			1½	....43½	28
			2	.....41½	26

Lap Weld

2	62	53½	2	 37	22½
2½ to 3	...65	56½	2½ to 3½	38	25
3½ to 6	...67	58½	4 to 8	.. 40	28½
7 and 8	..66	56½	9 to 12	.. 38	24½
9 and 10	..65½	56			
11 and 12	..64½	55			

Butt Weld, extra strong, plain ends

¼	.....55½	42½	⅛	...+13	+45½
¼ to ⅜	...57½	46½	¼ & ⅜	+2½	+34½
½	.....62½	54½	½	....32½	17½
¾	.....66½	58½	¾	....37½	22½
1 to 3	68	61	1 to 2	..43½	29

Lap Weld, extra strong, plain ends

2	60	52½	2	 40	26
2½ to 3	..64	56½	2½ to 4	45½	33
3½ to 6	..67½	60	4½ to 6	45	33½
7 and 8	..66½	57	7 & 8	.. 46	33
9 and 10	..65½	56	9 to 12	41½	30
11 and 12	..64½	55			

On butt-weld and lap-weld steel pipe jobbers are granted a discount of 5%. On less-than-carload shipments prices are determined by adding 20 and 25% and the carload freight rate to the base card.

Note—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Seamless Steel Commercial Boiler Tubes and Locomotive Tubes

(Net base prices per 100 ft. f.o.b. Pittsburgh in carload lots)

		Cold Drawn	Hot Rolled
1 in. o.d.	13 B.W.G.	$ 8.60	$ 7.82
1¼ in. o.d.	13 B.W.G.	10.19	9.26
1½ in. o.d.	13 B.W.G.	11.26	10.23
1¾ in. o.d.	13 B.W.G.	12.81	11.64
2 in. o. d.	13 B.W.G.	14.35	13.04
2¼ in. o.d.	13 B.W.G.	16.00	14.54
2¼ in. o.d.	12 B.W.G.	17.61	16.01
2½ in. o.d.	12 B.W.G.	19.29	17.54
2¾ in. o.d.	12 B.W.G.	20.45	18.59
3 in. o.d.	12 B.W.G.	21.45	19.50
4½ in. o.d.	10 B.W.G.	41.08	37.35
3½ in. o.d.	11 B.W.G.	27.09	24.62
4 in. o.d.	10 B.W.G.	33.60	30.54
4½ in. o.d.	10 B.W.G.	41.08	37.35
5 in. o.d.	9 B.W.G.	51.56	46.87
6 in. o.d.	7 B.W.G.	79.15	71.90

Extras for less-carload quantities:

25,000 lb. or ft. to 39,999 lb. or ft.	5 %
12,000 lb. or ft. to 24,999 lb. or ft.	12½ %
6,000 lb. or ft. to 11,999 lb. or ft.	25 %
2,000 lb. or ft. to 5,999 lb. or ft.	35 %
Under 2,000 lb. or ft.	50 %

Lapweld Steel and Knobbled Charcoal Iron Pressure Tubes

(Net base prices per 100 ft. f.o.b. Pittsburgh, in carload lots)

		Steel	*Iron*
1½ in. o.d.	13 B.W.G.	$ 9.72	$20.16
1¾ in. o.d.	13 B.W.G.	11.06	21.84
2 in. o.d.	13 B.W.G.	12.38	17.23
2¼ in. o.d.	13 B.W.G.	13.79	19.58
2½ in. o.d.	12 B.W.G.	16.58	24.19
2¾ in. o.d.	12 B.W.G.	17.54	26.40
3 in. o.d.	12 B.W.G.	18.35	28.39
3¼ in. o.d.	11 B.W.G.	21.56	33.95
3½ in. o.d.	11 B.W.G.	23.15	36.16
4 in. o.d.	10 B.W.G.	28.66	45.36
4½ in. o.d.	10 B.W.G.	35.22	50.48
5 in. o.d.	9 B.W.G.	44.25	61.86
6 in. o.d.	7 B.W.G.	68.14	102.46

Quantity Extras:

40,000 lb. or ft.	base
25,000 lb. or ft. to 39,999 lb. or ft.	plus 5%
10,000 lb. or ft. to 24,999 lb. or ft.	plus 12½ %
2,000 lb. or ft. to 9,999 lb. or ft.	plus 25%
Under 2,000 lb. or ft.	plus 40%

CAST IRON WATER PIPE

	Per Net Ton
*6-in. and larger, del'd Chicago	$48.00
*4-in., del'd Chicago	51.40
6-in. and larger, del'd New York	45.20
4-in., del'd New York	48.20
*6 in. and larger, Birmingham	40.00
*4-in. Birmingham	43.00
6-in. and larger, f.o.b. dock, San Francisco or Los Angeles	48.00
F.o.b. dock, Seattle	48.50
4-in., f.o.b. dock, San Francisco or Los Angeles	51.00
F.o.b. dock, Seattle	51.50

Class "A" and gas pipe, $3 extra.

* Prices for lots of less than 200 tons. For 200 tons and over, 6-in. and larger is $39, Birmingham, and $47.40, delivered Chicago, and 4-in. pipe, $42, Birmingham, and $50.40 a ton, delivered Chicago.

RAILROAD MATERIALS

Rails and Track Supplies

F.o.b. Mill

Standard rails, heavier than 60 lb. per gross ton	$36.37½
Angle bars, per 100 lb.	2.55

F.o.b. Code Basing Points

Light rails (from billets) per gross ton	$35.00
Light rails (from rail steel) per gross ton	34.00

	Base per 100 Lb.
Spikes, 9/16 in. and larger	$2.60
Spikes, ½ and smaller	2.60
Tie plates, steel	1.90
Tie plates, Pacific Coast ports	2.00
Track bolts, to steam railroads	3.60
Track bolts, no jobbers, all sizes (per 100 counts)	70 per cent off list

Basing points on light rails are Pittsburgh, Chicago and Birmingham; on spikes and tie plates, Pittsburgh, Chicago, Buffalo, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; on tie plates alone, Steelton, Pa.; on spikes alone, Cleveland, Youngstown, Lebanon, Pa., Columbia, Pa., Richmond, Va.

BOLTS, NUTS, RIVETS AND SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Per Cent Off List

Machine and carriage bolts:
½ in. x 6 in. and smaller..70, 10 and 5
Larger than ½ in.....70 and 10
Lag bolts .....70 and 10
Plow bolts, Nos. 1, 2, 3 and 7 heads .....70 and 10
Hot-pressed nuts, blank or tapped, square .....70 and 10
Hot-pressed nuts, blank or tapped, hexagon .....70 and 10
C.p.c. and t. square or hex. nuts, blank or tapped .....70 and 10
Semi-finished hexagon nuts, U.S.S. and S.A.E., all sizes to and incl. 1 in. diameter.....60, 20 and 15
Larger than 1 in. diameter.60, 20 and 15
Stove bolts in packages, Pittsburgh 72½ and 10
Stove bolts in packages, Chicago, 72½ and 10
Stove bolts in packages, Cleveland, 72½ and 10
Stove bolts in bulk, Pittsburgh.....82½
Stove bolts in bulk, Chicago.....82½
Stove bolts in bulk, Cleveland.....82½
Tire bolts 55

Large Rivets

(½-in. and larger)

Base per 100 Lb.

F.o.b. Pittsburgh or Cleveland.....$2.90
F.o.b. Chicago 3.00
F.o.b. Birmingham 3.05

Small Rivets

(7/16-in. and smaller)

Per Cent Off List

F.o.b. Pittsburgh .....70 and 5
F.o.b. Cleveland .....70 and 5
F.o.b. Chicago and Birm'g'm.....70 and 5

Cap and Set Screws

(Freight allowed up to but not exceeding 65c. per 100 lbs. on lots of 200 lb. or more)

Per Cent Off List

Milled cap screws, 1 in. dia. and smaller .....80, 10 and 10
Milled standard set screws, case hardened, 1 in. dia. and smaller..... 75
Milled headless set screws, cut thread ⅝ in. and smaller..... 75
Upset hex. head cap screws U.S.S. or S.A.E. thread, 1 in. and smaller.. 85
Upset set screws, cut and oval points .....75 and 10
Milled studs .....65 to 65 and 10

Alloy and Stainless Steel

Alloy Steel Ingots

F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem.
Uncropped .....$40 per gross ton

Alloy Steel Blooms, Billets and Slabs

F.o.b. Pittsburgh, Chicago, Canton Massillon, Buffalo, Bethlehem.
Base price, $49 a gross ton.

Alloy Steel Bars

Price del'd Detroit is $52.

F.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton.
Open-hearth grade, base .....2.45c.
Delivered price at Detroit is.....2.60c.

S.A.E. Series Numbers	Alloy Differential per 100 lb.
2000 (½% Nickel)	$0.25
2100 (2½% Nickel)	0.95
2300 (3½% Nickel)	1.50
2500 (5% Nickel)	2.25
3100 Nickel Chromium	0.55
3200 Nickel Chromium	1.35
3300 Nickel Chromium	3.80
3400 Nickel Chromium	3.20
4100 Chromium Molybdenum (0.15 to 0.25 Molybdenum)	0.50
4100 Chromium Molybdenum (0.25 to 0.40 Molybdenum)	0.70
4600 Nickel Molybdenum (0.20 to 0.30) Molybdenum (1.50 to 2.00 Nickel)	1.05
5100 Chromium Steel (0.60 to 0.90 Chromium)	0.35
5100 Chromium Steel (0.80 to 1.10 Chromium)	0.45
5100 Chromium Spring Steel	base
6100 Chromium Vanadium Bar	1.10c.
6100 Chromium Vanadium Spring Steel	0.70
Chromium Nickel Vanadium	1.40
Carbon Vanadium	0.85

These prices are for hot-rolled steel bars. The differential for most grades in electric furnace steel is 50c. higher. The differential for cold-drawn bars ½c. per lb. higher with separate extras. Blooms, billets and slabs under 4x4 in. or equivalent are sold on the bar base. Slabs with a section area of 16 in. and 2½ in. thick or over take the billet base. Sections 4x4 in. to 10x10 in. or equivalent carry a gross ton price, which is the net price for bars for the same analysis. Larger sizes carry extras.

Alloy Cold-Finished Bars

F.o.b. Pittsburgh, Chicago, Gary, Cleveland or Buffalo, 2.95c. base per lb.

STAINLESS STEEL No. 302

(17 to 19% Cr. 7 to 9% NI. 0.08 to 0.20% C.)

(Base Prices f.o.b. Pittsburgh)

	Per Lb.
Forging billets	19.55c.
Bars	23c.
Plates	26c.
Structural shapes	23c.
Sheets	33c.
Hot-rolled strip	20¾c.
Cold-rolled strip	27c.
Drawn wire	23c.

Raw and Semi-Finished Steel

Billets, Blooms and Slabs

F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham.

Per Gross Ton

Rerolling $28.00
Forging quality 35.00

Delivered Detroit

Rerolling $31.00
Forging 38.00

Billets Only F.o.b. Duluth

Rerolling $30.00
Forging 37.00

Sheet Bars

F.o.b Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

Per Gross Ton

Open-hearth or Bessemer.....$28.00

Skelp

F.o.b. Pittsburgh, Chicago, Youngstown, Buffalo, Coatesville, Pa., Sparrows Point, Md.

Per Lb.

Grooved ..... 1.80c.
Universal ..... 1.80c.
Sheared ..... 1.80c.

Wire Rods

(Nos. 4 and 5)

Per Gross Ton

F.o.b. Pittsburgh $38.00
F.o.b. Cleveland 38.00
F.o.b. Chicago 39.00
F.o.b. Anderson, Ind. 39.00
F.o.b. Youngstown 39.00
F.o.b. Worcester, Mass..... 40.00
F.o.b. Birmingham 41.00
F.o.b. San Francisco..... 47.00
F.o.b. Galveston 44.00

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Pig Iron and Ferroalloys

PIG IRON

PRICES PER GROSS TON AT BASING POINTS

Basing Points	No. 2 Fdry.	Malleable	Basic	Bessemer
Everett, Mass.	$20.50	$21.00	$20.00	$21.50
Bethlehem, Pa.	20.50	21.00	20.00	21.50
Birdsboro, Pa.	20.50	21.00	20.00	21.50
Swedeland, Pa.	20.50	21.00	20.00	21.50
Steelton, Pa.	....	....	20.00	....
Sparrows Point, Md.	20.50	....	20.00	....
Neville Island, Pa.	19.50	19.50	19.00	20.00
Sharpsville, Pa.	19.50	19.50	19.00	20.00
Youngstown	19.50	19.50	19.00	20.00
Buffalo	19.50	20.00	18.50	20.50
Erie, Pa.	19.50	20.00	19.00	20.50
Cleveland	19.50	19.50	19.00	20.00
Toledo, Ohio	19.50	19.50	19.00	20.00
Jackson, Ohio	21.25	21.25	20.75	....
Detroit	19.50	19.50	19.00	20.00
Hamilton, Ohio	19.50	19.50	19.00	20.00
Chicago	19.50	19.50	19.00	20.00
Granite City, Ill.	19.50	19.50	19.00	....
Duluth, Minn.	20.00	20.00	....	20.50
Birmingham	15.50	15.50	14.50	20.00
Provo, Utah	17.50	....	17.00	....

DELIVERED PRICES PER GROSS TON AT CONSUMING CENTERS

	No. 2 Fdry.	Malleable	Basic	Bessemer
Boston Switching District From Everett, Mass.	$21.00	$21.50	$20.50	$22.00
Brooklyn From Eastern Pa.	22.9289	23.4289	....	....
Newark or Jersey City, N. J. From Eastern Pa.	21.9873	22.4873	21.4873	22.9873
Philadelphia From Eastern Pa.	21.3132	21.8132	20.8132	22.3132
Cincinnati From Hamilton, Ohio	20.5807	20.5807	20.0807	21.0807
Canton, Ohio From Cleveland and Youngstown	20.8482	20.8482	20.3482	21.3482
Columbus, Ohio From Hamilton, Ohio	21.64	21.64	....	....
Mansfield, Ohio From Cleveland and Toledo	21.3832	21.3832	20.8832	21.8832
Indianapolis From Hamilton, Ohio	21.9289	21.9289	....	....
South Bend, Ind. From Chicago	21.6935	21.6935	....	....
Milwaukee From Chicago	20.57	20.57	....	....
St. Paul From Duluth	21.94	....	....	....
Davenport, Iowa From Chicago	21.3832	21.3832	....	....
Kansas City From Granite City	22.2178	22.2178	....	....
San Francisco, Los Angeles or Seattle. From Provo	22.315	....	....	....

Delivered prices on Southern iron for shipment to Northern points are 38c. a gross ton below delivered prices from the nearest Northern basing points.

LOW PHOSPHORUS PIG IRON

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.....$24.00

GRAY FORGE PIG IRON

Valley furnace $19.00
Pittsburgh district furnace 19.00

CHARCOAL PIG IRON

Lake Superior furnace $22.00

Delivered Chicago 25.2528

Delivered Buffalo 25.595

CANADA

Pig Iron

Per gross ton:

Delivered Toronto

No. 1 fdy., sil. 2.25 to 2.75.....$21.00
No. 2 fdy., sil. 1.75 to 2.75..... 20.50
Malleable 22.50

Delivered Montreal

No. 1 fdy., sil. 2.25 to 2.75.....$22.50
No. 2 fdy., sil. 1.75 to 2.25..... 22.00
Malleable 22.50
Basic 22.00

FERROALLOYS

Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans.

Per Gross Ton

Domestic, 80% (carload) $75.00

Spiegeleisen

Per Gross Ton Furnace

Domestic, 19 to 21%.....$26.00
50-ton lots 3-mo. shipment..... 24.00
F.o.b. New Orleans 26.00

Electric Ferrosilicon

Per Gross Ton Delivered

50% (carloads) $77.50
50% (ton lots) 85.00
75% (carloads) 126.00
75% (ton lots) 136.00

Silvery Iron

F.o.b. Jackson, Ohio, Furnace

Per Gross Ton		*Per Gross Ton*	
6.00 to 6.50%	$22.75	12%....	$29.75
6.51 to 7.00%	23.25	13%....	30.75
7.00 to 7.50%	23.75	14%....	32.25
7.51 to 8.00%	24.25	15%....	33.75
8.00 to 8.50%	24.75	16%....	35.25
8.51 to 9.00%	25.25	17%....	36.75
9.00 to 9.50%	25.75		
9.51 to 10.00%	26.25		
10.00 to 10.50%	26.75		
10.51 to 11.00%	27.25		
11.00 to 11.50%	27.75		
11.51 to 12.00%	28.25		

The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed. Base prices at Buffalo are $1.25 a ton higher than at Jackson.

Manganese 2 to 3%, $1 a ton additional. For each unit of manganese over 3%, $1 a ton additional. Phosphorus 0.75% or over, $1 a ton additional.

Bessemer Ferrosilicon

F.o.b. Jackson, Ohio, Furnace

Per Gross Ton		*Per Gross Ton*	
10.00 to 10.50%	$27.75	13%....	$31.75
10.51 to 11.00%	28.15	14%....	33.25
11.00 to 11.50%	28.75	15%....	34.75
11.51 to 12.00%	29.25	16%....	36.25
12%	30.25	17%....	37.75

Manganese 2 to 3%, $1 a ton additional. For each unit of manganese over 3%, $1 a ton additional. Phosphorus 0.75% or over, $1 a ton additional.

Base prices at Buffalo are $1.25 a ton higher than at Jackson.

Other Ferroalloys

Ferrotungsten, per lb. contained W, del., carloads $1.30
Ferrotungsten, lots of 5000 lb..... 1.35
Ferrotungsten, smaller lots 1.40
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr per lb. contained Cr delivered, in carloads, and contract ..... 10.00c.
Ferrochromium, 2% carbon .....16.50c. to 17.00c.
Ferrochromium, 1% carbon .....17.50c. to 18.00c.
Ferrochromium, 0.10% carbon .....19.50c. to 20.00c.
Ferrochromium, 0.06% carbon .....20.00c. to 20.50c.
Ferrovanadium, del. per lb. contained V. .....$2.70 to $2.90
Ferrocolumbium, per lb. contained columbium, f.o.b. Niagara Falls, N. Y. $2.50
Ferroarbontitanium, 15 to 18% Ti, 7 to 8% C, fo.b. furnace carload and contract per net ton.$137.50
Ferrocarbontitanium, 17 to 20% Ti, 3 to 5% C, f.o.b. furnace, carload and contract, per net ton.. 142.50
Ferrophosphorus, electric, or blast furnace material, in carloads, f.o.b. Anniston, Ala., for 18%, with $3 unitage, freight equalized with Rockdale, Tenn., per gross ton 58.50
Ferrophosphorus, electric, 24%, in carlots, f.o.b. Anniston, Ala., per gross ton with $3 unitage, freight equalized with Nashville, Tenn. 75.00
Ferromolybdenum, per lb. Mo. del. 95c.
Calcium molybdate, per lb. Mo, del. ..... 80c.
Silico spiegel, per ton, f.o.b. furnace, carloads $38.00
Ton lots or less, per ton 45.50
Silico-manganese, gross ton, delivered.
2.50% carbon grade 85.00
2% carbon grade 90.00
1% carbon grade 100.00
Spot prices .....$5 a ton higher

Iron and Steel Scrap

PITTSBURGH

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	$15.50 to $16.00
No. 2 heavy melting steel	14.00 to 14.50
No. 2 railroad wrought	15.50 to 16.00
Scrap rails	15.75 to 16.25
Rails, 3 ft. and under	16.50 to 17.00
Compressed sheet steel	15.50 to 16.00
Hand bundled sheet steel	14.00 to 14.50
Hvy. steel axle turnings	13.50 to 14.00
Machine shop turnings	10.50 to 11.00
Short shov. turnings	10.50 to 11.00
Short mixed borings and turnings	8.25 to 9.25
Cast iron borings	10.50 to 11.00
Cast iron carwheels	14.00 to 14.50
Heavy breakable cast	13.00 to 13.50
No. 1 cast	15.00 to 15.50
Railr. knuckles and couplers	17.25 to 17.75
Rail. coil and leaf springs	17.25 to 17.75
Rolled steel wheels	17.25 to 17.75
Low phos. billet crops	18.00 to 18.50
Low phos. sheet bar crops	17.50 to 18.00
Low phos. punchings	17.00 to 17.50
Low phos. plate scrap	17.00 to 17.50
Steel car axles	16.00 to 16.50

CHICAGO

Delivered Chicago district consumers:

	Per Gross Ton
Heavy melting steel	$14.50 to $15.00
Automobile hvy. melt steel	12.50 to 13.00
Shoveling steel	14.50 to 15.00
Hydraulic comp. sheets	14.00 to 14.50
Drop forge flashings	12.00 to 12.50
No. 1 busheling	13.50 to 14.00
Rolled carwheels	16.00 to 16.50
Railroad tires	16.00 to 16.50
Railroad leaf springs	16.00 to 16.50
Axle turnings	13.00 to 13.50
Steel couplers and knuckles	16.00 to 16.50
Coil springs	16.50 to 17.00
Axle turnings (elec. fur.)	14.25 to 14.75
Low phos. punchings	17.00 to 17.50
Low phos. plates, 12 in. and under	17.00 to 17.50
Cast iron borings	7.50 to 8.00
Short shoveling turnings	8.50 to 9.00
Machine shop turnings	7.50 to 8.00
Rerolling rails	15.50 to 16.00
Steel rails less than 3 ft.	17.25 to 17.75
Steel rails less than 2 ft.	17.50 to 18.00
Angle bars, steel	16.00 to 16.50
Cast iron carwheels	14.00 to 14.50
Railroad malleable	18.00 to 18.50
Agricultural malleable	14.50 to 15.00

	Per Net Ton
Iron car axles	$18.50 to $19.00
Steel car axles	15.25 to 15.75
No. 1 railroad wrought	13.00 to 13.50
No. 2 railroad wrought	13.00 to 13.50
No. 2 busheling, old	7.50 to 8.00
Locomotive tires, smooth	13.00 to 13.50
Pipes and flues	8.00 to 8.50
No. 1 machinery cast	13.00 to 13.50
Clean automobile cast	12.50 to 13.00
No. 1 railroad cast	12.50 to 13.00
No. 1 agricultural cast	10.75 to 11.25
Stove plate	8.00 to 8.50
Grate bars	9.50 to 10.00
Brake shoes	9.75 to 10.25

PHILADELPHIA

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	$13.50 to $14.00
No. 2 heavy melting steel	12.00 to 12.50
Hydraulic compressed, new	12.00 to 12.50
Hydraulic compressed, old	9.50 to 10.00
Steel rails for rolling	14.50 to 15.00
Cast iron carwheels	14.50 to 15.00
Heavy breakable cast	13.50 to 14.00
No. 1 cast	14.00 to 14.50
Stove plate (steel works)	11.00 to 11.50
Railroad malleable	16.50 to 17.00
Machine shop turnings	8.00 to 8.50
No. 1 blast furnace	6.25
Cast borings	6.00
Heavy axle turnings	10.25 to 11.75
No. 1 low phos. heavy	17.00 to 17.50
Couplers and knuckles	17.00 to 17.50
Rolled steel wheels	17.00 to 17.50
Steel axles	16.50 to 17.00
Shafting	18.25 to 18.75
No. 1 railroad wrought	13.00 to 13.50
Spec. iron and steel pipe	10.50 to 11.00
Bundled sheets	11.00 to 11.50
No. 1 forge fire	12.00 to 12.50
Cast borings (chem.)	10.50 to 13.00

CINCINNATI

Dealers' buying prices per gross ton:

No. 1 heavy melting steel	$12.00 to $12.50
No. 2 heavy melting steel	10.00 to 10.50
Scrap rails for melting	11.50 to 12.00
Loose sheet clippings	8.00 to 8.50
Bundled sheets	9.00 to 9.50
Cast iron borings	7.00 to 7.50
Machine shop turnings	7.75 to 8.25
No. 1 busheling	9.50 to 10.00
No. 2 busheling	5.25 to 5.75
Rails for rollings	12.00 to 12.50
No. 1 locomotive tires	10.50 to 11.00
Short rails	15.00 to 15.50
Cast iron carwheels	11.50 to 12.00
No. 1 machinery cast	12.50 to 13.00
No. 1 railroad cast	11.75 to 12.25
Burnt cast	8.75 to 9.25
Stove plate	8.75 to 9.25
Agricultural malleable	10.75 to 11.25
Railroad malleable	12.50 to 13.00

CLEVELAND

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	$14.50 to $15.00
No. 2 heavy melting steel	13.50 to 14.00
Compressed sheet steel	13.75 to 14.25
Light bundled sheet stampings	10.50 to 11.00
Drop forge flashings	13.00 to 13.50
Machine shop turnings	8.50 to 9.00
Short shoveling turnings	8.75 to 9.25
No. 1 busheling	13.50 to 14.00
Steel axle turnings	13.00 to 13.50
Low phos. billet crops	17.50 to 18.00
Cast iron borings	9.00 to 9.50
Mixed borings and short turnings	9.00 to 9.50
No. 2 busheling	9.00 to 9.50
No. 1 cast	15.00 to 15.50
Railroad grate bars	8.00 to 8.50
Stove plate	9.00 to 9.50
Rails under 3 ft.	17.50 to 18.00
Rails for rolling	17.00 to 17.50
Railroad malleable	17.75 to 18.50
Cast iron carwheels	.... 15.00

BUFFALO

Per gross ton, f.o.b. Buffalo consumers' plants:

No. 1 heavy melting steel	$13.50
No. 2 heavy melting scrap	$12.00 to 12.50
Scrap rails	13.00 to 13.50
New hydraul. comp. sheets	12.00 to 12.50
Old hydraul. comp. sheets	10.00 to 10.50
Drop forge flashings	11.50 to 11.75
No. 1 busheling	12.00 to 12.50
Hvy. steel axle turnings	11.25 to 11.75
Machine shop turnings	8.00 to 8.50
Knuckles and couplers	15.50 to 16.00
Coil and leaf springs	15.50 to 16.00
Rolled steel wheels	15.50 to 16.00
Low phos. billet crops	16.00 to 16.50
Short shov. steel turnings	8.25 to 8.75
Short mixed borings and turnings	8.25 to 8.75
Cast iron borings	8.25 to 8.75
No. 2 busheling	.... 7.00
Steel car axles	12.50 to 13.00
Iron axles	12.50 to 13.00
No. 1 machinery cast	13.50 to 14.00
No. 1 cupola cast	12.50 to 13.00
Stove plate	11.00 to 11.50
Steel rails, 3 ft. and under	14.50 to 15.00
Cast iron carwheels	12.00 to 12.50
Railroad malleable	16.25 to 16.75
Chemical borings	9.00 to 9.50

BOSTON

Dealers' buying prices per gross ton:

*No. 1 heavy melting steel	.... $11.00
No. 1 heavy melting steel	9.40 to 9.90
*Scrap rails	.... 11.00
Scrap rail's	9.40 to 9.90
*No. 2 steel	.... 10.00
No. 2 steel	8.75 to 9.00
Breakable cast	.... 8.75
*Machine shop turnings	5.75 to 5.85
Machine shop turnings	.... 4.40
Bundled skeleton, 'ong	8.00 to 8.05
Shafting	.... 13.75
Engine blocks, stripped	.... 8.50
Cast iron borings, chemical	5.00 to 7.00
Cotton ties	.... 6.00
*Stove plate	.... 7.00

Per gross ton delivered consumers' yards:

Textile cast	$10.00 to $11.00
No. 1 machinery cast	10.00 to 11.00
Stove plate	6.50 to 7.00

* Delivered local army base.

NEW YORK

Dealers' buying prices per gross ton:

No. 1 heavy melting steel	$9.25 to 9.50†*
No. 2 heavy melting steel	8.25 to 8.50†*
Heavy breakable cast	9.00 to 9.50
No. 1 machinery cast	9.50 to 10.00
No. 2 cast	†8.25 to *8.75
Stove plate	†7.00 to *7.50
Steel car axles	13.50 to 14.00
Shafting	13.50 to 13.75
No. 1 railroad wrought	9.50 to 10.00
No. 1 yard wrought long	8.50 to 9.00
Spec. iron and steel pipe	8.00 to 8.50
Forge fire	7.50 to 8.00
Rails for rollings	11.00 to 12.00
Short shoveling turnings	5.00 to 5.50
Machine shop turnings	4.50 to 5.00
Cast borings	4.50 to 5.00
No. 1 blast furnace	3.00 to 3.50
Cast borings (chemical)	10.00 to 11.00
Unprepared yard iron and steel	5.50 to 6.00

Per gross ton, delivered local foundries:

No. 1 machinery cast	.... $11.50
No. 1 hvy. cast (cupola size)	.... 9.50
No. 2 cast	.... 8.00

† Loading on barge.
*$1.00 to $1.50 higher offered at nearby New Jersey points for rail shipments.

BIRMINGHAM

Per gross ton delivered consumers' yards:

Heavy melting steel	$11.00 to $11.50
Scrap steel rails	11.50 to 12.00
Short shoveling turnings	.... 7.00
Stove plates	.... 8.00
Steel axles	12.00 to 12.50
Iron axles	12.00 to 12.50
No. 1 railroad wrought	8.50 to 9.00
Rails for rolling	12.50 to 13.00
No. 1 cast	12.00 to 12.50
Tramcar wheels	11.00 to 12.00

ST. LOUIS

Dealers' buying prices per gross ton delivered consumers' works:

Selected heavy steel	$12.50 to $13.00
No. 1 heavy melting	12.50 to 13.00
No. 2 heavy melting	11.50 to 12.00
No. 1 locomotive tires	11.00 to 11.50
Misc. stand-sec. rails	13.00 to 13.50
Railroad springs	12.00 to 12.50
Bundled sheets	9.50 to 10.00
No. 2 railroad wrought	12.50 to 13.00
No. 1 busheling	7.50 to 8.00
Cast iron borings and shoveling turnings	4.50 to 5.00
Rails for rolling	13.75 to 14.25
Machine shop turnings	4.00 to 4.50
Heavy turnings	9.25 to 9.75
Steel car axles	13.00 to 13.50
Iron car axles	15.00 to 16.00
No. 1 railroad wrought	10.50 to 11.00
Steel rails less than 3 ft.	13.50 to 14.00
Steel angle bars	13.00 to 13.50
Cast iron carwheels	11.00 to 11.50
No. 1 machinery cast	11.25 to 11.75
Railroad malleable	14.25 to 14.75
No. 1 railroad cast	11.25 to 11.75
Stove plate	7.50 to 8.00
Agricult. malleable	12.50 to 13.00

DETROIT

Dealers' buying prices per gross ton:

No. 1 heavy melting steel	$11.50 to $12.00
No. 2 heavy melting steel	$10.00 to $10.50
Borings and turnings	7.00 to 7.50
Long turnings	6.50 to 7.00
Short shoveling turnings	7.50 to 8.00
No. 1 machinery cast	14.00 to 14.50
Automotive cast	14.00 to 14.50
Hydraulic comp. sheets	12.50 to 13.00
Stove plate	8.75 to 9.25
New factory busheling	10.75 to 11.25
Old No. 2 busheling	6.00 to 6.50
Sheet clippings	9.00 to 9.50
Flashings	10.75 to 11.25
Low phos. plate scrap	12.00 to 12.50

CANADA

Dealers' buying prices per gross ton:

	Toronto	Montreal
Heavy melting steel	$7.50	$7.00
Rails, scrap	8.50	8.00
Machine shop turnings	4.00	4.00
Boiler plate	7.00	6.00
Heavy axle turnings	4.50	4.00
Cast borings	5.00	4.50
Steel borings	4.00	4.00
Wrought pipe	4.00	4.00
Steel axles	8.50	9.00
Axles, wrought iron	9.00	9.50
No. 1 machinery cast	11.50	11.00
Stove plate	7.50	7.00
Standard carwheels	11.00	10.50
Malleable	7.00	7.00
Shoveling steel	6.50	6.00
Bushelings	6.00	5.50
Compressed sheets	6.50	6.00

ORES, FLUORSPAR, COKE, FUEL, REFRACTORIES

Lake Superior Ores

Delivered Lower Lake Ports

	Per Gross Ton
Old range, Bessemer, 51.50% iron	$4.80
Old range, non-Bessemer, 51.50% iron	4.65
Mesabi, Bessemer 51.50% iron	4.65
Mesabi, non-Bessemer, 51.50% iron	4.50
High phosphorus, 51.50% iron	4.40

Foreign Ore

C.i.f. Philadelphia or Baltimore

	Per Unit
Iron, low phos., copper free, 55 to 58% iron dry Spanish or Algeria	10.25c.
Iron, low phos., Swedish, average 68½% iron	10.25c.
Iron, basic or foundry, Swedish, aver. 65% iron	9.50c.
Iron, basic or foundry, Russian, aver. 65% iron	Nominal
Manganese, Caucasian, washed 52%	26c.
Manganese, African, Indian, 44-48%	25c.
Manganese, African, Indian, 49-51%	26c.
Manganese, Brazilian, 46 to 48½%	24c.

	Per Net Ton Unit
Tungsten, Chinese, wolframite, duty paid, delivered, nominal	$16.00
Tungsten, domestic, scheelite delivered, nominal	16.00

	Per Gross Ton
Chrome, 45% Cr_2O_3, lump, c.i.f. Atlantic Seaboard (African)	$17.50
45 to 46% Cr_2O_3 (Turkish)	$16.50 to $17.00
48% Cr_2O_3 (African)	20.50
48% min. Cr_2O_3 (Turkish)	19.25
Chrome concentrate, 50% and over Cr_2O_3, c.i.f. Atlantic Seaboard	22.00
52% Cr_2O_3 (Turkish)	21.75
48 to 49% Cr_2O_3 (Turkish)	19.25

Fluorspar

	Per Net Ton
Domestic, washed gravel, 85-5, f.o.b. Kentucky and Illinois mines for all rail shipment	$18.00
No. 2 lump, 85-5, f.o.b. Kentucky and Illinois mines	18.00
Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic ports, duty paid	20.50
Domestic No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines	30.00

COKE, COAL AND FUEL OIL

Coke

	Per Net Ton
Furnace, f.o.b. Connellsville Prompt	$3.65 to $3.80
Foundry, f.o.b. Connellsville Prompt	4.25 to 5.75
Foundry, by-product, Chicago ovens, for delivery outside switching district	9.00
Foundry, by-product, delivery in Chicago switching district	9.75
Foundry, by-product, New England, delivered	11.50
Foundry, by-product, Newark or Jersey City, del'd	9.65
Foundry, by-product, Phila.	9.38
Foundry, by-product, Cleveland, delivered	9.75
Foundry, by-product, Cincinnati, del'd	9.50
Foundry, Birmingham	$6.50
Foundry, by-product, St. Louis, f.o.b. ovens	8.00
Foundry, by-product, del'd St. Louis	9.00
Foundry, from Birmingham, f.o.b. cars docks, Pacific ports	14.75

Coal

	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	$1.50 to $1.75
Mine run coking coal, f.o.b. W. Pa.	1.90 to 2.10
Gas coal, ¾-in. f.o.b. Pa. mines	2.00 to 2.25
Mine run gas coal, f.o.b. Pa. mines	1.80 to 2.00
Steam slack, f.o.b. W. Pa. mines	1.00 to 1.25
Gas slack, f.o.b. W. Pa. mines	1.20 to 1.45

Fuel Oil

	Per Gal. f.o.b. Bayonne, N. J.
No. 3 distillate	4.25c.
No. 4 industrial	3.87½c.

	Per Gal. f.o.b. Baltimore
No. 3 distillate	4.25c.
No. 4 industrial	3.87½c

	Per Gal del'd Chicago
No. 3 industrial, fuel oil	5.00c.
No. 5 industrial fuel oil	3.77c.

	Per Gal. f.o.b. Cleveland
No. 3 distillate	6.00c.
No. 4 industrial	5.75c.
No. 5 industrial	5.25c.

REFRACTORIES

Fire Clay Brick

	Per 1000 f.o.b. Works High-heat Duty Brick	Intermediate Duty Brick
Pennsylvania	$45.00	$40.00
Maryland	45.00	40.00
New Jersey	50.00	43.00
Ohio	40.00	35.00
Kentucky	45.00	40.00
Missouri	45.00	40.00
Illinois	45.00	40.00
Ground fire clay, per ton	7.00	

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	$45.00
Chicago District	54.00
Birmingham	$48.00 to 50.00
Silica cement per net ton	8.00

Chrome Brick

	Per Net Ton
Standard f.o.b. Baltimore, Plymouth Meeting and Chester, Pa.	$45.00
Chemically bonded f.o.b. Baltimore, Plymouth Meeting and Chester, Pa.	45.00

Magnesite Brick

	Per Net Ton
Standard, f.o.b. Baltimore and Chester, Pa.	$65.00
Chemically bonded, f.o.b. Baltimore	55.00

Grain Magnesite

	Per Net Ton
Imported, f.o.b. Baltimore and Chester, Pa. (in sacks)	$45.00
Domestic, f.o.b. Baltimore and Chester, in sacks	40.00
Domestic, f.o.b. Chewelah, Wash.	22.00

Warehouse Prices for Steel Products

PITTSBURGH

	Base per Lb.
Plates	3.15c.
Structural shapes	3.15c.
Soft steel bars and small shapes	2.95c.
Reinforcing steel bars	2.90c.
Cold-finished and screw stock:	
Rounds and hexagons	3.35c.
Squares and flats	3.35c.
Hoops and bands under ¼ in.	3.20c.
Hot-rolled annealed sheets (No. 24), 25 or more bundles	3.30c.
Galv. sheets (No. 24), 25 or more bundles	3.95c.
Hot-rolled sheets (No. 10)	2.95c.
Galv. corrug. sheets (No. 28), per square (more than 3750 lb.)	$3.69
Spikes, large	2.90c.
Track bolts, all sizes, per 100 count, 65 per cent off list.	
Machine bolts, 100 count, 65 per cent off list.	
Carriage bolts, 100 count, 65 per cent off list.	
Nuts, all styles, 100 count, 65 per cent off list.	
Large rivets, base per 100 lb.	$3.50
Wire, black, soft ann'l'd, base per 100 lb.	2.65c.
Wire, galv. soft, base per 100 lb.	3.00c.
Common wire nails, per keg	2.60c.
Cement coated nails, per keg	2.60c.

On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applies to orders of 400 to 9999 lb.

*Delivered in Pittsburgh switching district.

CHICAGO

	Base per Lb.
Plates and structural shapes	3.20c.
Soft steel bars, rounds	3.00c.
Soft steel bars, squares and hexagons	3.15c.
Cold-fin. steel bars:	
Rounds and hexagons	3.50c.
Flats and squares	3.50c.
Hot-rolled strip	3.30c.
Hot-rolled annealed sheets (No. 24)	3.85c.
Galv. sheets (No. 24)	4.55c.
Hot-rolled sheets (No. 10)	3.05c.
Spikes (keg lots)	3.50c.
Track bolts (keg lots)	4.65c.
Rivets, structural (keg lots)	3.65c.
Rivets, boiler (keg lots)	3.75c.
	Per Cent Off List
Machine bolts	*70
Carriage bolts	*70
Lag screws	*70
Hot-pressed nuts, sq. tap or	
Hot-pressed nuts, sq. tap or blank	*70
Hot-pressed nuts, hex. tap or	
Hot-pressed nuts, hex. tap or blank	*70
Hex. head cap screws	87½
Cut point set screws	75 and 10
Flat head bright wood screws	70
Spring cotters	55
Stove bolts in full packages	70
Rd. hd. tank rivets, 7/16 in. and smaller	57½
Wrought washers	$4.50 off list
Black ann'l'd wire per 100 lb.	$3.85
Com. wire nails, base per keg	2.95†
Cement c't'd nails, base per keg	2.95†

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 9999 lb. All prices are f.o.b. consumers' plants within the Chicago switching district.

*These are quotations delivered to city trade for quantities of 100 lb. or more. For lots of less than 100 lb., the quotation is 65 per cent off. Discounts applying to country trade are 70 per cent off, f.o.b. Chicago, with full or partial freight allowed up to 50c. per 100 lb.

†Prices for city and suburbs only.

NEW YORK

	Base per Lb.
Plates, ¼ in. and heavier	3.40c.
Structural shapes	3.37c.
Soft steel bars, rounds	3.31c.
Iron bars	3.31c.
Iron bars, swed. charcoal	6.75c. to 7.00c.
Cold-fin. shafting and screw stock:	
Rounds and hexagons	3.81c.
Flats and squares	3.81c.
Cold-rolled; strip, soft and quarter hard	3.36c.
Hoops	3.56c.
Bands	3.56c.
Hot-rolled sheets (No. 10)	3.31c.
Hot-rolled ann'l'd sheets (No. 24*)	3.89c.
Galvanized sheets (No. 24*)	special
Long terne sheets (No. 24)	5.25c.
Standard tool steel	11.00c.
Wire, black annealed (No. 10)	3.40c.
Wire, galv. (No. 10)	3.75c.
Tire steel, 1 x ⅛ in. and larger	3.75c.
Open hearth spring steel	4.00c. to 10.00c.
Common wire nails, base, per keg	$3.21
	Per Cent Off List
Machine bolts, square head and nut:	
All diameters	65 and 10
Carriage bolts, cut thread:	
All diameters	65 and 10
Boiler tubes:	Per 100 Ft.
Lap welded, 2-in.	$18.05
Seamless welded, 2-in.	19.24
Charcoal iron, 2-in.	24.94
Charcoal iron, 4-in.	63.65

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

ST. LOUIS

	Base per Lb.
Plates and struc. shapes	3.45c.
Bars, soft steel (rounds and flats)	3.25c.
Bars, soft steel (squares, hexagons, ovals, half ovals and half rounds)	3.40c.
Cold-fin. rounds, shafting, screw stock	3.75c.
Hot-rolled annealed sheets (No. 24)	4.10c.
Galv. sheets (No. 24)	4.65c.
Hot-rolled sheets (No. 10)	3.30c.
Black corrug. sheets (No. 24)	4.10c.
*Galv. corrug. sheets	4.65c.
Structural rivets	4.00c.
Boiler rivets	4.10c.
	Per Cent Off List
Tank rivets, 7/16 in. and smaller	55
Machine and carriage bolts, lag screws, fitting up bolts, bolt ends, plow bolts, hot-pressed nuts, square and hexagon, tapped or blank, semi-finished nuts; All quantities	70

*No. 26 and lighter take special prices.

PHILADELPHIA

	Base per Lb.
*Plates, ¼-in. and heavier	2.98c.
*Structural shapes	2.98c.
*Soft steel bars, small shapes, iron bars (except bands)	3.03c.
‡Reinforc. steel bars, sq. twisted and deformed	2.96c.
Cold-finished steel bars	3.76c.
*Steel hoops	3.43c.
*Steel bands, No. 12 and 3/16 in. incl.	3.18c.
Spring steel	5.00c.
†Hot-rolled anneal. sheets (No. 24)	3.65c.
†Galvanized sheets (No. 24)	4.40c.
*Hot-rolled annealed sheets (No. 10)	3.08c.
Diam. pat. floor plates, ¼ in.	4.95c.
Swedish iron bars	6.25c.

These prices are subject to quantity differentials except on reinforcing and Swedish iron bars.

*Base prices subject to deduction on orders aggregating 4000 lb. or over.

†For 25 bundles or over.

‡For less than 2000 lb.

CLEVELAND

	Base per Lb.
Plates and struc. shapes	3.31c.
Soft steel bars	3.00c.
Reinforc. steel bars	2.10c.
†Cold-finished steel bars	3.50c.
Flat-rolled steel under ¼ in.	3.36c.
Cold-finished strip	†3.00c.
Hot-rolled annealed sheets (No. 24)	3.91c.
Galvanized sheets (No. 24)	4.61c.
Hot-rolled sheets (No. 10)	3.11c.
Hot-rolled 3/16 in. 24 to 48 in. wide sheets	3.56c.
*Black ann'l'd wire, per 100 lb.	$2.40
*No. 9 galv. wire, per 100 lb.	2.75
*Com. wire nails, base per keg	2.35

†Outside delivery 10c. less.

*For 5000 lb. or less.

CINCINNATI

	Base per Lb.
Plates and struc. shapes	3.42c.
Bars, rounds, flats and angles	3.22c.
Other shapes	3.37c.
Rail steel reinforc. bars	3.25c.
Hoops and bands, 3/16 in. and lighter	3.47c.
Cold-finished bars	3.72c.
Hot-rolled annealed sheets (No. 24)	4.02c.
Galv. sheets (No. 24)	4.72c.
Hot-rolled sheets (No. 10)	3.22c.
Structural rivets	4.35c.
Small rivets	55 per cent off list
No. 9 ann'l'd wire, per 100 lb. (1000 lb. or over)	$2.88
Com. wire nails, base per keg:	
Any quantity less than carload	3.04
Cement c't'd nails, base 100-lb. keg	3.50
Chain, lin. per 100 lb	8.35
	Net per 100 Ft.
Seamless steel boiler tubes, 2-in.	$20.37
4-in.	48.14
Lap-welded steel boiler tubes, 2-in.	19.38
4-in.	45.32

BUFFALO

	Base per Lb.
Plates	3.88c.
Struc. shapes	3.25c.
Soft steel bars	3.05c.
Reinforcing bars	2.60c.
Cold-fin. flats and sq.	3.55c.
Rounds and hex.	3.55c.
Cold-rolled strip steel	3.19c.
Hot-rolled annealed sheets (No. 24)	4.06c.
Heavy hot-rolled sheets (3/16 in., 24 to 48 in. wide)	3.63c.
Galv. sheets (No. 24)	4.70c.
Bands	3.43c.
Hoops	3.43c.
Heavy hot-rolled sheets	3.18c.
Com. wire nails, base per keg	$3.15
Black wire, base per 100 lb. (2500-lb. lots or under)	3.50
(Over 2500 lb.)	3.40

BOSTON

	Base per Lb.
Beams, channels, angles, tees, zees	3.54c.
H beams and shapes	3.54c.
Plates—Sheered, tank and univ. mill, ¼ in. thick and heavier	3.56c.
Floor plates, diamond pattern	5.36c.
Bar and bar shapes (mild steel)	3.45c.
Bands 3/16 in. thick and No. 12 ga. incl.	3.65c. to 4.65c.
Half rounds, half ovals, ovals and bevels	4.70c.
Tire steel	4.70c.
Cold-rolled strip steel	3.245c.
Cold-finished rounds, squares and hexagons	3.90c.
Cold-finished flats	3.90c.
Blue annealed sheets, No. 10 ga.	3.65c.
One pass cold-rolled sheets No. 24 ga.	4.20c.
Galvanized steel sheets, No. 24 ga.	4.90c.
Lead coated sheets, No. 24 ga.	5.85c.

Price delivered by truck in metropolitan Boston, subject to quantity differentials.

DETROIT

	Base per Lb.
Soft steel bars	3.09c.
Structural shapes	3.42c.
Plates	3.42c.
Floor plates	5.17c.
Hot-rolled annealed sheets (No. 24)	3.94c.
Hot-rolled sheets (No. 10)	3.14c.
Galvanized sheets (No. 24)**	4.72c.
Bands	3.39c.
Hoops	3.39c.
†Cold-finished bars	3.64c.
Cold-rolled strip	3.18c.
Hot-rolled alloy steel (S.A.E. 3100 Series)	5.29c.*
Bolts and nuts, in cases, 70 and 10 per cent off list	
Broken cases	70 per cent off

Prices delivered by truck in metropolitan Detroit, subject to quantity differentials.

*Price applies to 1,000 lb. and over.

†With reduction in chemical extras.

**0.25c. off list for 10 to 25 bundles; 0.50c. for 25 bundles and over, Detroit delivery only.

MILWAUKEE

	Base per Lb.
Plates and structural shapes	3.31c.
Soft steel bars, rounds up to 8 in., flats and fillet angles	3.11c.
Soft steel bars, squares and hexagons	3.26c.
Hot-rolled strip	3.41c.
Hot-rolled sheets (No. 10)	3.16c.
Hot-rolled annealed sheets (No. 24)	3.96c.
Galvanized sheets (No. 20)	4.66c.
Cold-finished steel bars	3.61c.
Cold-rolled strip	3.33c.
Structural rivets (keg lots)	3.86c.
Boiler rivets, cone head (keg lots)	3.96c.
Track spikes (keg lots)	3.71c.
Track bolts (keg lots)	4.86c.
Black annealed wire	3.15c.
Com. wire nails	2.85c.
Cement coated nails	2.85c.
	Per Cent Off List
Machine bolts	70 and 10
Carriage bolts	70 and 10
Hot-pressed nuts, sq. and hex. tapped or blank (keg lots)	70 and 10

Prices given above are delivered Milwaukee.

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 9999 lb. On galvanized and No. 24 hot-rolled annealed sheets the prices given apply on orders of 400 to 1500 lb. On cold-finished bars the prices are for orders of 1000 lb. or more of a size.

ST. PAUL

	Base per Lb.
Mild steel bars, rounds	3.25c.
Structural shapes	3.45c.
Plates	3.45c.
Cold-finished bars	4.02c.
Bands and hoops	3.55c.
Hot-rolled annealed sheets, No. 24	3.90c.
Galvanized sheets, No. 24	4.50c.
Cold-rolled sheets, No. 20	4.95c.

On mild steel bars, shapes, plates and hoops and bands the base applies on 400 to 14,999 lb. On hot-rolled sheets, galvanized sheets and cold-rolled sheets base applies on 15,000 lb. and over. Base on cold-finished bars is 1000 lb. and over of a size.

BALTIMORE

	Base per Lb.
*Mild steel bars	3.00c.
**Reinforcing bars	2.85c.
*Structural shapes	3.00c.
†Plates	3.00c.
†Hot-rolled sheets, No. 10	3.10c.
‡Hot-rolled annealed sheets, No. 24	3.60c.
‡Galvanized sheets, No. 24	4.30c.
*Bands	3.20c.
*Hoops	3.45c.
§Cold-rolled rounds	3.58c
§Cold-rolled squares, hex. and flats	3.58c.
Rivets	4.40c.
Bolts and nuts, per cent off list	60 and 10

*Quantity extras per size apply. †Quantity extras per thickness apply. Hot-rolled quantity extras are: 2000 lb. and over, base: 1500 lb. to 1999 lb. add 15c. per 100 lb.; 1000 lb. to 1499 lb. add 30c.; 0 to 999 lb., add 50c.

‡25 bundles and over, base. For 1 to 9 bundles add 50c. per 100 lb.; for 10 to 24 bundles add 25c.

§Base for 1000 lb. and over. For 500 to 999 lb. add 25c. per 100 lb.; for 300 to 499 lb. add $1.00; for 0 to 299 lb. add $1.75; for combined order under 100 lb. add $3.00.

**For orders 4000 lb. to 9999 lb. Add 15c. per 100 lb. for orders 2000 to 3999 lb.; add 65c. for orders less than 2000 lb.

CHATTANOOGA

	Base per Lb.
Mild steel bars	3.36c.
Iron bars	3.36c.
Reinforcing bars	3.36c.
Structural shapes	3.56c.
Plates	3.56c.
Hot-rolled sheets, No. 10	3.36c.
Hot-rolled annealed sheets, No. 24	4.16c.
Galvanized sheets, No. 24	4.86c.
Steel bands	3.61c.
Cold-finished bars	3.98c.

MEMPHIS

	Base per Lb.
Mild steel bars	3.47c.
Shapes, bar size	3.47c.
Iron bars	3.47c.
Structural shapes	3.67c.
Plates	3.67c.
Hot-rolled sheets, No. 10	3.47c.
Hot-rolled annealed sheets, No. 24	4.27c.
Galvanized sheets, No. 24	4.80c.
Steel bands	3.72c.
Cold-drawn rounds	3.89c.
Cold-drawn flats, squares, hexagons	5.89c.
Structural rivets	4.25c.
Bolts and nuts, per cent off list	65
Small rivets, per cent off list	50

NEW ORLEANS

	Base per Lb.
Mild steel bars	3.35c.
Reinforcing bars	3.50c.
Structural shapes	3.55c.
Plates	3.55c.
Hot-rolled sheets, No. 10	3.55c.
Hot-rolled annealed sheets, No. 24	4.50c.
Galvanized sheets, No. 24	4.95c.
Steel bands	3.95c.
Cold-finished steel bars	4.30c.
Structural rivets	4.25c.
Boiler rivets	4.25c.
Common wire nails, base per keg	$2.95
Bolts and nuts, per cent off list	70

PACIFIC COAST

	Base per Lb. San Francisco	Los Angeles	Seattle
Plates, tank and U. M.	3.25c.	3.60c.	3.55c.
Shapes, standard	3.25c.	3.60c.	3.55c.
Soft steel bars	3.25c.	3.60c.	3.70c.
Reinforcing bars, f.o.b. cars dock Pacific ports	2.45c.	2.45c.	2.45c.
Hot-rolled annealed sheets (No. 24)	4.00c.	4.35c.	4.40c.
Hot-rolled sheets (No. 10)	3.35c.	3.70c.	3.75c.
Galv. sheets (No. 24)	4.50c.	4.95c.	5.00c.
Cold finished steel Rounds	5.80c.	5.85c.	6.00c.
Squares and hexagons	7.05c.	7.10c.	7.25c.
Flats	7.55c.	7.60c.	8.25c.
Common wire nails —base per keg less carload	$3.20	$3.20	$3.20

All items subject to differentials for quantity.

TOOL STEEL

Prices are same for warehouse distribution at all points on or East of Mississippi River. West of Mississippi quotations are 1c. a lb. higher.

	Base per Lb.
High speed	57c.
High carbon chrome	37c.
Oil hardening	22c.
Extra	17c.
Regular	17c.

Steel Ingot Production Up Nine Points at Cleveland

Heavier March Specifications Resulting from Second Quarter Price Announcements Contribute to Gain —Railroad Buying Promising

CLEVELAND, March 17.—With a further expansion in demand for finished steel, ingot output in the Cleveland-Lorain district has advanced nine points this week to 79 per cent of capacity. An additional open-hearth furnace was put on by each of the plants.

Stimulation of business in finished steel as a result of the new price announcements so far has been limited to sheets and to a lesser degree to strip steel. With producers still taking orders for March shipment at the $3 a ton concession recently prevailing regardless of quantity, consumers are ordering freely to secure shipments before the new quantity differentials and deductions become effective April 1. Orders for considerable sheet tonnage also had been sent to mills to be entered for April delivery should prices remain unchanged. Now these buyers are having those orders advanced for March shipment.

Automobile manufacturers continue to buy sheets and strip steel, but not in large lots. The price announcements evidently did not affect the volume of business from that source. Some consumers are testing out the market to determine whether the new quantity differentials are to be rigidly observed and are being told that there will be no deviation from the provision specifying that an order be for one size and one grade and that it be shipped to one designation at the same time in order to entitle it to the deduction schedule for that particular quantity.

The Erie Railroad has issued its inquiry for 19,000 tons of rails and accessories and 800 cars and the Chesapeake & Ohio, and Nickel Plate are buying accessories for 26,800 tons of rails they recently purchased.

Pig Iron

Contracting for the second quarter continues in fair volume. Many consumers appear to be covering for their minimum expected requirements and may need additional iron before the end of the quarter. Shipments have increased, this being partly because some consumers have not yet taken out all the iron covered by their fourth quarter contracts. With few exceptions all the iron due on these low-price contracts will be delivered by March 31, the deadline shipping date. Demand from automotive foundries and from the railroad equipment field is growing. Many foundries have increased their pig iron consumption because of the scarcity of good cast scrap.

Bars, Plates and Shapes

Bar business has increased in volume since the issuance of the new price list. Larger orders are coming from forge shops making automobile parts. Hot-rolled alloy steel bars have been re-established at the present 2.45c. base with new quantity differentials. Quantity deductions and extras also have been applied to alloy billets, blooms and slabs. No price announcements have been made in respect to reinforcing bars but efforts are expected to be made to eliminate the recent price irregularities on these bars. Activity in the construction field is limited to public work. The Ohio Highway Department took bids today for a Lorain County bridge and several small bridges, requiring 2000 tons of structural shapes, and will receive bids shortly for a grade crossing elimination near Bedford, requiring approximately 500 tons.

Sheets

New demand has increased, particularly from the automobile parts makers. The $3 a ton concession that has prevailed recently is still in effect for current orders, which makes it advantageous for small-lot consumers to stock up at present prices. Producers plan to avoid loading up at the ruling prices with more tonnage than they can ship by about April 1 when the new quantity differentials become effective. Consumers in many cases had sent in specifications for April shipment providing prices did not go up, but now are asking for March delivery. Some mills already have all the cold-rolled sheet tonnage they can ship this month and are taking no more business.

Some consumers, especially automotive parts makers, are dissatisfied with the new extras and deductions, claiming that with the new price set-up they will be at a disadvantage as compared with larger competitors. Present practice of buying may be modified because of the differentials, as many who have depended on several sources of supply will find it advantageous to depend on one mill, or at least will rearrange their orders so that they will secure all of one gage and one size from one source.

Strip Steel

As recent price concessions are still in effect for current orders, these prices are generally lower than they will be in the second quarter with the new quantity deductions. This has resulted in considerable increase in miscellaneous business for March delivery.

Rails, Accessories and Cars

The Erie Railroad has its inquiry out for 19,000 tons of rails for which it will take bids March 19 and also for track accessories for laying these rails. The Chesapeake & Ohio Railroad and Nickel Plate road are placing the accessories for their recent rail purchases of 20,000 tons and 6800 tons respectively. The Chesapeake & Ohio will requre 4600 tons of tie plates. This road is also inquiring for 750 tons of screw spikes for laying rails purchased last fall. The Erie inquiry for 500 box cars and 300 self-unloading automobile cars has also come out. The Chesapeake & Ohio car inquiry which has not yet come out is expected to call for 5000 gondola cars and perhaps 2000 of other types.

Iron Ore

Quotations against the recent inquiry of the Ford Motor Co. for 490,000 tons of ore have been requested to be submitted March 25, although an extension of time may be granted. Ore firms have not yet reached any decision on prices, but it seems quite probable that last year's quotations will be reaffirmed.

Warehouse Business

Jobbers have reduced wire nails 5c. per keg to $2.35 and have made a corresponding reduction on black annealed and galvanized wire. These changes reflect the recent change in mill prices.

Scrap

With more liberal offerings due to the mild weather brokers have reduced their paying price 25c. a ton on heavy melting steel and 50c. a ton on a few other grades. Blast furnace scrap is unchanged.

TRIPLE COMPRESSION

SCRAP BALERS

STYLE

100 TC

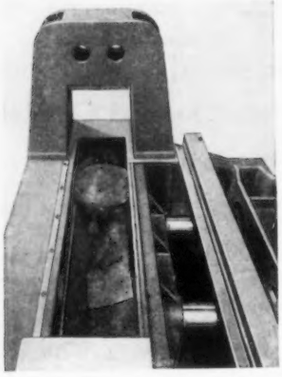
(100 x 51 x 36)

and other sizes

Also Regular

Double Ram Presses

in all sizes



GALLAND-HENNING MANUFACTURING COMPANY

2724 S. 31st Street Milwaukee, Wisconsin

COMPLETE LINE OF BALERS: Electric and Hydraulic, also HYDRAULIC PRESSES AND PUMPS

Fabricated Structural Steel

Lettings in Good Volume—New Projects Higher

AWARDS of 31,750 tons, which are mostly in small lots, compare with 33,000 tons last week. Among sizable bookings are 9000 tons for a bridge across the Connecticut River at Middletown, Conn., 8120 tons for the high level bridge at Homestead, Pa., for the Allegheny County Authority, and 3650 tons for an addition to the Viscose Co. plant at Meadville, Pa. New projects total 19,525 tons as against 18,000 tons in the previous week and 11,350 tons two weeks ago. The outstanding new job is 5000 tons for a bridge across the Sacramento River at Redding, Cal., a part of the Central Valley project. The TVA will require 2000 tons for transmission towers at Decatur, Ala., and the New York Central will take 1800 tons for the West Side express highway in New York, between Ninety-second and 100th Streets. Plate lettings call for 1525 tons. Structural steel awards for the week follow:

NORTH ATLANTIC STATES

Hopkinton, N. H., 170 tons, State bridge, to Kittredge Bridge Co.

St. Johnsbury, Vt., 180 tons, State highway bridge, to Bethlehem Steel Corpn.

Madison, Conn., 110 tons, school to Berlin Construction Co.

Pittsfield, Mass., 145 tons, bridges, to Phoenix Bridge Co.

New York, 1700 tons, public school No. 13 in Bronx, to Lehigh Structural Steel Co.

New York, 335 tons, apartment house 46 West Seventy-eighth Street, to Harris Structural Steel Co.

New York, 100 tons, for apartment building at 54-70 Cooper Street, to D & R Structural Steel & Ornamental Works, Inc.

Long Island City, N. Y., 240 tons, two apartment buildings at Forty-second Street and Skillman Avenue, to Cypress Iron Works.

Camden, N. J., 300 tons, building for Campbell Soup Co., to American Steel Engineering Co.

Hempstead, Long Island, 270 tons, Ruppert Brewery, to Joseph T. Ryerson.

Merrick, Long Island, 635 tons, high school, to Lehigh Structural Steel Co.

Philadelphia, 380 tons, Conrad Street school, to Fort Pitt Bridge Works Co.

Marcus Hook, Pa., 610 tons, Viscose Co. boiler and power house, to Belmont Iron Works.

Homestead, Pa., 8120 tons, high level bridge for Allegheny County Authority, to American Bridge Co.

New Kensington, Pa., 850 tons, building No. 44 for Aluminum Co. of America, to Fort Pitt Bridge Works Co.

Meadville, Pa., 3650 tons, plant addition for Viscose Co., to Bethlehem Steel Corpn.

Middletown, Conn., 9000 tons, bridge over Connecticut River, to Bethlehem Steel Corpn.

SOUTH AND SOUTHWEST

Tarrant County, Tex., 190 tons, overpass, to Mosher Steel & Machinery Co.

CENTRAL STATES

Cleveland, 110 tons, horticultural building for Great Lakes Exposition, to Ingalls Iron Works Co.

Collinsville, Ohio, 170 tons, Butler County bridge, to Pan American Bridge Co.

Hammond, Ind., 705 tons, gas plant processing building, to Wisconsin Bridge & Iron Co.

Fort Wayne, Ind., 245 tons, addition to boiler plant, to Pan American Bridge Co.

Peoria, Ill., 210 tons, Montgomery Ward store building, to Mississippi Valley Structural Steel Co.

St. Paul, Minn., 285 tons, swine barn for State of Minnesota, to St. Paul Foundry Co.

Polk County, Iowa, 675 tons, 500 ft. deck plate girder bridge, to Des Moines Steel Co.

Union County, Iowa, 115 tons, underpass, to Des Moines Steel Co.

WESTERN STATES

Fort Peck, Mont., 110 tons, portable bridge, to Des Moines Steel Co.

Lorenzo, Idaho, 600 tons, bridge, to Virginia Bridge Co.

Everett, Wash., 100 tons, pulp plant, to Isaacson Iron Works.

Everett, Wash., 250 tons, State highway bridge, to Pacific Car & Foundry Co.

Cheney, Wash., 100 tons, normal school, to Isaacson Iron Works.

Malheur County, Ore., 113 tons, State bridge over Owyhee River, to an unnamed bidder.

Los Angeles, 170 tons, two buildings for Federated Metals Co., to Pacific Iron & Steel Co.

Los Angeles, 800 tons, viaduct, to Consolidated Steel Corpn.

NEW STRUCTURAL STEEL PROJECTS

NORTH ATLANTIC STATES

New York, 1800 tons, express highway from Ninety-second to 100th streets for New York Central Railroad; bids March 31.

Jersey City, N. J., 700 tons, sheep and calf house, Pennsylvania Railroad.

Jersey City, 290 tons, science building, St. Peters College.

Weehawken, N. J., 600 tons, ventilating building, Port of New York Authority.

State of New Jersey, 325 tons, three bridges for Delaware, Lackawanna & Western Railroad; bids March 30.

Scranton, Pa., 1000 tons, school; bids March 23.

Attica, N. Y., 400 to 500 tons, cell block for State prison.

Amcelle, Md., 250 tons, building No. 58, Celanese Corpn.

THE SOUTH

State of Tennessee, 760 tons, Tri-city airports.

Decatur, Ala., 2000 tons, transmission towers for TVA.

Fort Worth, Tex., 700 tons, Coliseum Mountain Home.

CENTRAL STATES

Bedford, Ohio, 500 tons, Pennsylvania grade crossing elimination; bids April 14.

Jewett, Ohio, 170 tons, State highway bridge.

Centerville, Iowa, 250 tons, State highway bridge.

State of Wisconsin, 300 tons, bridges; bids March 27.

State of Wisconsin, 275 tons, Cuba City bridge; Eau Claire Engineering Co., Eau Claire, Wis., low bidder on general contract.

Shawano County, Wis., 300 tons, bridge; Wisconsin Bridge & Iron Co. low bidder.

St. Louis, 210 tons, Ivory Avenue viaduct; Condon, Cunningham & Lemon, St. Louis, low bidders on general contract.

Kansas City, Mo., 1675 tons, Twenty-third Street viaduct; Wisconsin Bridge & Iron Co. low bidder on general contract.

WESTERN STATES

Salt Lake City, Utah, 500 tons, buildings.

State of Idaho, 700 tons, bridge.

El Paso County, Colo., 310 tons, State bridge south of Colorado Springs; bids March 23.

Redding, Cal., 5000 tons, bridge over Sacramento River on Central Valley project; bids expected soon.

San Francisco, 1000 tons, State livestock building; Bethlehem Steel Corpn. low bidder.

Visitation, Cal., 350 tons, bridge.

FABRICATED PLATES

AWARDS

Danbury, Conn., 650 tons, water mains, to Walsh Holyoke Steam Boiler Works.

New York, 275 tons, caissons for express highway from Forty-eighth to Fifty-seventh streets, to Petroleum Iron Works, through James Stewart & Co., Inc.

Louisville, Ky., 600 tons, dredge for War Department, to Dravo Contracting Co.

SHEET PILING

NEW PROJECTS

El Paso, Tex., 300 tons sheet piling, Caballo Dam on Rio Grande project; bids April 2.

Financial Notes

Gulf States Steel Co., Birmingham, had net profit in 1935 of $141,268, as against a 1934 net loss of $58,039.

Aluminum Industries, Inc., Cincinnati, had net profit of $72,675 for 1935, equalling 73c. a share on the capital stock. In 1934 net profit was $69,661, or 70c.

Chicago Pneumatic Tool Co., New York, reports for itself and subsidiaries 1935 net profit at $729,999, or 48c. a common share. The 1934 net profit was $412,623.

Pittsburgh Forgings Co., Pittsburgh, reports 1935 net profit at $57,864, or 27c. a capital share, as against 1934 profit of $31,040, or 14c. a share.

Westinghouse Electric & Mfg. Co., Pittsburgh, reports 1935 net profit at $11,983,381, equal, after preferred dividend requirements, to $4.52 a share on 2,586,341 common shares. The 1934 net profit was $189,562.

United Engineering & Foundry Co., Pittsburgh, had 1935 net profit of $1,631,156, equal to $1.92 a share on the common stock, compared with $718,395, or $1.58 a share in 1934.

American Smelting & Refining Co., New York, reports for 1935 net income available for dividends, after all charges including taxes and bond interest, of $13,768,153, compared with $7,583,202 in 1934. After allowances for preferred stock payments, $5.01 a share was earned on the common stock. The comparable figure for 1934 was $1.63.

Pittsburgh Coal Co., Pittsburgh, had net loss for 1935 of $691,326 after all charges. This compares with a profit of $146,304 for 1934. Among causes responsible for its unfavorable record, the company cites the agitation set up in the industry by the codes, overproduction, and higher operating costs which could not be wholly passed along to the consumer due to intense competition.

The supreme test of BAR STEEL

- Cold Drawn Bars and Shafting
- Ultra-Cut Steel
- Special Sections
- Alloy Steels

BETTER MADE STEELS LABORATORY TESTED

WHEN your product must meet the most exacting specifications, you will want to use nothing less than the highest quality Cold Finished Steel—as tested to the highest commercial standards on

MAGNETIC ANALYSIS EQUIPMENT

This is an extra inspection service available to users of B&L Cold Drawn Bars, Screw Stock, and other items for special applications that require positive uniformity and freedom from blemish.

The "Magnetic Eye" detects hidden flaws which might show up in the finished parts and cause heavy rejection on particular jobs. It is a service you can use to advantage on certain requirements. Your inquiries are invited.

BLISS & LAUGHLIN, INC.

HARVEY, ILL. *Sales Offices in all Principal Cities* **BUFFALO, N.Y.**

Edward G. Budd Mfg. Co., Philadelphia, reports 1935 net profit at $743,412 after taxes and charges, compared with a loss of $1,398,832 in 1934. After preferred dividend requirements, 30c. a share on 1,060,618 outstanding shares of common was earned.

American Locomotive Co., New York, had 1935 net loss of $1,421,289 after depreciation, Federal capital stock taxes and other charges, and after including in income $50,182 appreciation in the market value of securities previously written down. The 1934 net loss totalled $2,071,825 after including in income $85,011 appreciation in the market value of securities previously written down.

International Nickel Co. of Canada, Ltd., Copper Cliff, Ontario, Canada, reports for 1935 net profit of $26,086,527, equal after preferred dividends to $1.65 a share on the common stock. This compares with $1.13 a share in 1934. In 1929 net profit was $22,235,997.

Phelps Dodge Corpn., New York, reports consolidated net income before depletion in 1935 of $6,147,878.

Philadelphia Operations Rise One Point—Buying Lags

Bethlehem Will Not Announce Price Schedule Until Thursday — Most Mills Loaded Up for March Delivery —Scrap Steady

PHILADELPHIA, March 17.—Many buyers here have followed the usual procedure of waiting until a price announcement and then jamming through orders for quick shipment if the announcement is unfavorable. In the current instance, however, only a moderate number of favorite customers have been able to secure this protection, inasmuch as mill rolling schedules were soon completed and most sellers were forced to refuse additional first quarter orders because of their inability to execute these orders. This situation has little significance as the quarter's end is less than two weeks away.

Bethlehem is the only mill which has failed to notify its customers regarding second quarter prices and extras on sheets and strip. The market generally expects Bethlehem's prices to conform to those already announced, but the delay has caused some nervousness. All other mills are rigidly applying second quarter extras to what little second quarter business which has developed. Several mills insist that no first quarter business will be shipped after the end of March whereas others believe that deliveries may lap over from one to two weeks.

No mill in this area is anxious to add new open-hearths to take care of the current bulge in demand for rolled steel. Several additions have been necessary, however, and the district rate has risen one point to 42 per cent of capacity. A similar rise is expected next week.

Pig Iron

With the passing of cold weather, shipping requisitions have increased moderately. Total releases are currently well above the average of last month, and most furnaces look for further improvement during the second quarter. During the past week several consumers have extended firm offers of several thousand tons at a price about $2 under the quoted market. Evidently these temptations failed to weaken furnaces' position for a good percentage of this business was subsequently placed at market price levels. Even though melters are convinced of the steadiness of the price basis, they are showing little enthusiasm for forward commitments. There has been isolated instances of contracting for delivery throughout the quarter, but new sales for the most part specify nearby delivery.

Warehouse Business

Turnover is better than it was a month ago when adverse weather was a discouraging factor. However, aggregate business volume for the entire first quarter will run approximately 10 per cent under the average for the preceding quarter, and, also, almost 10 per cent below the total for the first quarter of 1935. Quantity extras for hot-rolled annealed sheets and galvanized sheets have been revamped and are scheduled to go into effect tomorrow. Hot-rolled annealed sheets will sell for 4.10c., 3.90c. and 3.65c. for 1 to 9 bundles, 10 to 24 bundles and 25 bundles and over respectively. For the same quantity ranges, galvanized sheets will be quoted at 4.85c., 4.70c. and 4.40c. respectively.

Bars, Plates and Shapes

Demand continues to lag for these classes of steel. Although inquiry has shown signs of improving, actual jobs being figured or awarded still total far under the average usually expected of this area. Awards last week disposed of several projects which have been hanging fire for some time. Total awards for the seven-day period amounted to about 5300 tons, and new projects coming up during the week include three New Jersey bridges and a school at Scranton, Pa. Shipyards are taking frequent deliveries on old plate orders, but practically no new business was placed during the week. However, several mills expect to receive sizable tonnages over the next fortnight.

Sheets and Strip

Large western mills have closed first quarter books on practically all products, with the exception of a few ranges of hot-rolled and galvanized roofing and flat galvanized in jobbing sizes. The availability of these grades is of little impor-

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tance, however, for jobbers are fairly well covered and are showing little interest in the shaded prices still available. Local mills still have some light plates and blue-annealed stock for March delivery, but are none too willing to dispose of this material at $3 under the quoted price. There has been little tonnage placed for second quarter under the new quantity differential arrangement, and sellers look for no bulge in contracting inasmuch as an open price policy discourages contracting. All sellers, with the exception of Bethlehem, have announced or informed their customers regarding the new second quarter extras which were published last week. Bethlehem expects to make its announcement on Thursday. Even though every mill looks for Bethlehem to fall in line, a delay of this nature has a disquieting effect on the market.

Imports

The following iron and steel imports were received here last week: 1576 tons of pig iron from Soviet Russia; 23 tons of structural shapes from Belgium.

Scrap

Unfortunately the confusion in this market has not been clarified by any new sales. Although district mills are steadily resisting the $13.50 to $14 quotation on No. 1 steel, they have been unable to secure any tonnage offers outside of this range. Naturally sellers' positions have been enhanced by the constant withdrawal of No. 1 from the market for shipment to Port Richmond for export at an average price of $12.50. More significant is the fact that the Japanese have bought steel at $13.50 and $14 f.a.s.; have secured a number of boat charters, and have made it known that additional purchases are forthcoming. England, likewise, is in the market, but other countries, including Italy, are doing a lot of talking but very little buying. Two brokers are currently delivering No. 1 to Worth Steel Co. on the recent $13.50 sale. Delivery on this order will extend over 60 days and most of the material is moving from Chester and Wilmington, with freight averaging about 35c. a ton. Brokers are also buying No. 1 for Coatesville delivery and No. 2 for shipment on Alan Wood orders. Heavy breakable cast is bringing from $13 to $13.50 at Coatesville and Harrisburg.

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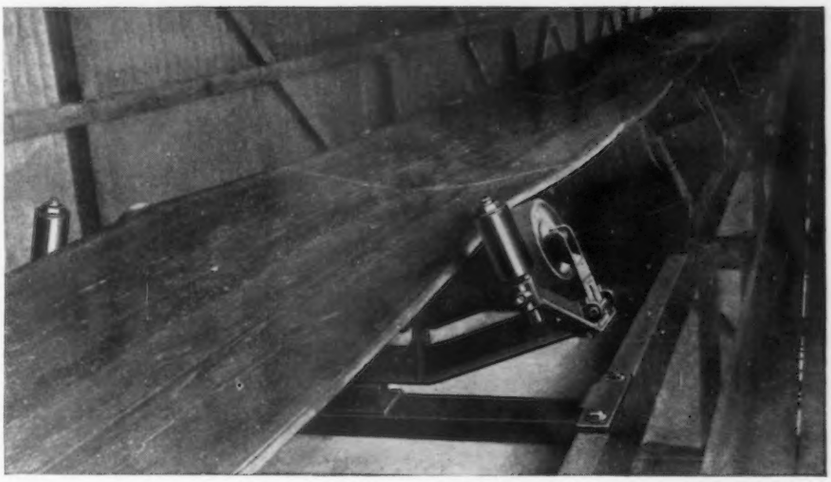
POSITIVE SELF-ALIGNING BELT CONVEYOR IDLER



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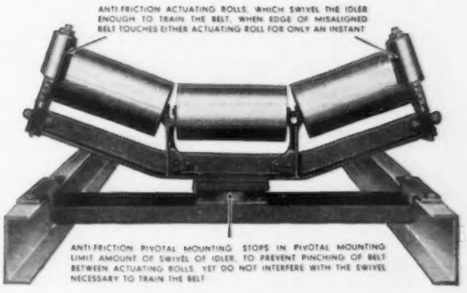
Either type is to be greatly preferred to using stationary "guide idlers," which do not correct or overcome belt misalignment, but merely restrain forcibly any further sidewise movement of the belt. For proper training, and longer life of the belt, use the pivoted self-aligning idler.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5534-BB
Iron Age

Steel Consumption Is Up at St. Louis

ST. LOUIS, March 17.—Manufacturer consumers are outstanding among buyers of finished steel, especially those who supply tanks, derricks and drums for the oil trade. Sheets are being ordered in heavy volume by stove interests. Structural fabricators are issuing more releases against contracts. Wisconsin Bridge Co. is low bidder on the Twenty-third Street viaduct, Kansas City, Mo., requiring 1675 tons of structurals and 500 tons of reinforcing bars. Condon, Cunningham & Lemon are low bidders on the Ivory Avenue viaduct, St. Louis, requiring 210 tons of structurals.

Pig iron shipments continue to improve, and March is expected to be a much better month than either January or February. While most of the buying is for spot shipment,

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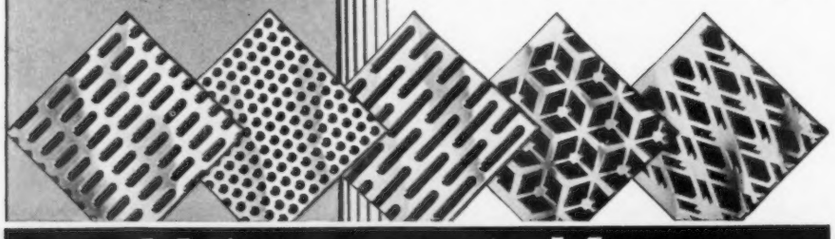

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there has been fair purchasing for movement throughout the second quarter. Stove foundries in the Belleville district are operating on a six-day-a-week schedule, the activity being due to new business and efforts to make up time lost during the enamelers' strike.

While there was no scrap buying by mills in the St. Louis industrial district during the week, the market for scrap iron is very steady, with prices unchanged. Shipments are freer as a result of better weather conditions. Mills are building up their reserve stocks by taking in material against contracts.

Birmingham Rail Mill Well Occupied

BIRMINGHAM, March 17.—Pig iron shipments are expected to be heavy this month, as all old commitments are to be cleared up. There has been some second quarter buying but the aggregate to date is not large, and no real activity has yet started.

Current steel business is mostly routine, with wire products and sheet orders in small lots.

Steel and iron production is maintaining a steady rate and has done so for more than a month. Twelve blast furnaces and 15 open-hearths are in operation.

The Ensley rail mill has unfilled orders on hand sufficient for at least two more months of production at the present rate, which is around 6000 tons a week.

A requisition has been filed with the State WPA Procurement Office by the Birmingham Industrial Water Commission for about 13,000 tons of steel pipe, estimated to cost around $1,150,000. The pipe will range from 42 in. to 60 in. with cast iron alternates for the 42 and 48-in. sizes. No date has yet been set for bids.

Nashville Bridge Co., Bessemer, Ala., has booked 100 tons of plate girders for a bridge over the Bowie River, near Hattiesburg, Miss. The April meeting of the Southern Structural Steel Board of Trade has been scheduled for Birmingham on April 9. Shook & Fletcher Supply Co., Birmingham, is planning to construct an ore washer in the Russellville, Ala., brown ore district.

Boston Scrap Market Strengthens Further

BOSTON, March 17.—Two steamers have just arrived here to load scrap and another is expected within the next ten days. A boat is loading at Providence, R. I., and there has been a further slight gain in the movement to Pennsylvania points. Activity in scrap is thus increasing rather than diminishing and prices are very strong. Current sales of No. 1 export steel are at $11 a ton, delivered Army Base, and No. 2 is at $10, whereas a week or so ago 25c. a ton less was done in a few instances. Both textile and No. 1 machinery cast prices average 50c. a ton higher, and all other materials command outside rather than inside quotations. The 7500 tons of scrap leaving last week for Italy was the largest individual lot shipped from here on record and because of ice, snow and cold weather required a month to load.

Pig iron buying is not developing as anticipated by furnace representatives, and the outlook is problematical. Since March 1 there has been quite a noticeable drop in the Connecticut foundry melt, and orders for castings have not developed, as expected, in other New England States. As a result the New England melt has dropped to close to 40 per cent of rated capacity and melters have sufficient iron on hand or on order to last through April, or even through the second quarter. Two brands of Continental iron are offered at concessions, but Indian and domestic interests are holding prices rigidly.

Reinforcing Steel

Awards 2060 Tons—New Projects 4800 Tons

AWARDS

Portland, Conn., 600 tons, bridge, to Concrete Steel Co.

Madison, Conn., 150 tons, school, to Truscon Steel Co.

Medford, Mass., 150 tons, city office building, to Concrete Steel Co.

New York, 1000 tons, contract No. 12 in Bronx, to Joseph T. Ryerson & Son, Inc., through Rodgers & Hagerty, Inc., contractors.

Weld County, Colo., 157 tons, State bridge near Greeley, to an unnamed bidder.

NEW REINFORCING BAR PROJECTS

New York, 690 tons, park projects through Procurement Division of Treasury Department; bids March 17.

New York, 350 tons, express highway, Ninety-second to 100th Streets, New York Central Railroad; bids March 31.

Long Beach, N. Y., 750 tons, board walk, National Excavation Corpn., low bidder.

Berkeley Heights, N. J., 225 tons, grade crossing; bids March 30.

Wharton, N. J., 101 tons, grade crossing elimination; bids March 30.

Kansas City, Mo., 500 tons, Twenty-third Street viaduct, Wisconsin Bridge & Iron Co. low bidder on general contract.

El Paso County, Colo., 100 tons, State bridge south of Colorado Springs; bids March 23.

Los Angeles, 1280 tons, Macy Street subway; bids April 8.

El Paso, Tex., 790 tons, Caballo dam on Rio Grande project; bids April 2.

Rush Orders for March Shipment Heavy in East

Buyers in Metropolitan District Are Anxious to Build Up Stocks for Second Quarter—Outdoor Construction Expands

NEW YORK, March 17.—Announcement of second quarter prices and quantity differentials on bars, sheets and strip steel prompted many consumers to place heavy orders for March shipment in order to take advantage of recent bargain prices. Mills are consequently well booked for the remainder of the month and are beginning to refuse orders for immediate delivery. In some cases, shipment will have to be extended into the first half of April.

Improved weather has brought about a marked increase in outdoor construction activity. Highway projects have come to life in all nearby States with much new inquiry, as well as heavy releases against old contracts. Building activity in the metropolitan area is definitely broadening. While large jobs financed by the Federal Government still predominate, private construction is greater and the outlying boroughs of New York are witnessing the first large scale apartment building in five years. While the buildings are mostly small, the aggregate is considerable and new construction in Manhattan is expected to be revived in the near future.

Railroad specifications are well sustained, but new inquiry is not plentiful. The New Haven is taking bids today on 50 passenger coaches, but has not made formal inquiry for freight cars. It is reported that the New York Central may announce a car-building program in the near future. The Third Avenue Line in Manhattan has placed 100 street cars with its own shops and 60 with the shops of a subsidiary.

The 9000 tons of structural steel for the bridge over the Connecticut River at Middletown, Conn., has been let to the Bethlehem Steel Corpn., while the substructure requirements are being purchased by the general contractor. A section of the New York Central track elevation from Ninety-second to 100th Street, Manhattan, requiring 1800 tons of shapes, 350 tons of bars and an undetermined amount of steel piling, will be bid March 31. The requirements of the second section of the Sixth Avenue subway have not yet been figured.

Demand for tin plate is improving steadily, with beer can requirements of increasing importance. The pipe market is quiet, although movement of standard pipe is increasing. Oil companies are also showing more interest in pipe line steel and are inquiring for considerable material for tanks, barrels and drums.

Pig Iron

Sales are in heavier volume, but not all sellers are participating. The recent 600-ton purchase by A. P. Smith Co., Bloomfield, N. J., was split into 100-ton lots and distributed among five different sellers. Last week an additional large inquiry was satisfied when The Thatcher Co., Newark, N. J., placed 500 tons. Other local interests during the past week have negotiated for heavy lots running in some cases as high as 1000 tons, but domestic producers have been unwilling to meet such offers on the basis that price concessions of $2 a ton be granted so as to reach parity with foreign irons. The outcome has been that lesser tonnages have been placed with domestic producers by the parties concerned, and prices have held up. On account of this circumstance, it is probable that sales of foreign brands have picked up to some extent, although there is no reason for believing that the refusal of domestic producers to satisfy potential customers has diverted excessive tonnages elsewhere.

Reinforcing Steel

The only large award reported last week was 1000 tons to Joseph T. Ryerson & Son, Inc., for contract 12 in the Bronx, which has been on the books for over a month and has been delayed awaiting PWA approval. Prices remain fair, but some sellers are of the opinion that a few buyers who took advantage of recent weaknesses in the price structure are overstocked for present needs and that a buying slump will result as a consequence for the next few weeks. Most of the jobs for the future are part of the New Jersey highway program, bids on 1000 tons of which were taken Monday. An additional 325 tons is coming up March 30. National Excavation Corpn., New York, is reported low on 750 tons for a boardwalk at Long Beach, N. Y. Bids were taken March 17 on 690 tons for various park projects through the procurement division of the Treasury.

Scrap

Although heavy melting steel and cast grades are still in urgent demand in eastern Pennsylvania, there is very little fresh domestic business coming into the market to take the place of contracts being liquidated. A compensating factor, however, is an improved export situation. Japan has purchased in fair amounts at between $12.50 and $13, the British Isles are constantly after additional supplies and are currently the largest outlets for material from this port, and other European countries are actively inquiring for commitments but are still unwilling to meet brokers' prices. In the domestic market, specification pipe has been bought by brokers for $8.50 a ton or better, and is not very plentiful at this level. Heavy breakable continues to be loaded here for delivery into eastern Pennsylvania at $13.50 to $14 delivered, and No. 1 is likewise bringing $13.50, or better, delivered. Other less important grades of scrap are moving only in occasional carlots, and quoted prices in some cases are nominal in the absence of definite tests.

Railroad Equipment

Western Pacific has been authorized to issue $3,000,000 of trustees' certificates to aid in financing deferred maintenance and purchase of 100 hopper cars, aggregate cost not to exceed $3,900,000. Deferred maintenance work will consist in part of laying 183.05 miles of new rails, rebuilding and rehabilitating 850 freight cars, air conditioning four units of passenger equipment, replacing arch bar trucks with cast steel trucks on 1000 cars and applying economy devices to various locomotives.

New York Central is inquiring for seven Diesel-electric locomotives.

Louisiana & Arkansas is inquiring for five locomotives of 2-8-2 type.

Pacific Fruit Express is asking bids on 3000 refrigertor cars and alternate bids on 3000 underframes on a revised inquiry.

Great Northern has ordered 500 ore cars from American Car & Foundry Co.

Chesapeake & Ohio will repair 1700 70-ton steel hopper cars in its shops at Russell, Ky.

ONLY SUPER-DREDNAUT GOGGLES CAN Provide MAXIMUM Eye Protection

The deep curve in Super-Drednaut Lenses plays the same important part as the curve or arch in bridge construction — both provide ADDED STRENGTH, and added strength in Super-Drednaut Lenses provides added protection to the eyes of workmen who wear Super-Drednaut Goggles.

And, another important fact, one that means MAXIMUM eye protection—is, that even if lens should become broken by a tremendous blow, the curvature tends to prevent the glass from being driven into the eye. ONLY curved lenses CAN give this protection.

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Pacific Coast Steel Mills at Capacity

SAN FRANCISCO, March 17.—With $15,000,000 allotted, and plans and specifications rapidly being completed by the Bureau of Reclamation, commencement on various units of the Central Valley project should be under way in the near future. The $170,000,000 program embraces the construction of the Friant Dam on the San Joaquim River, the Kennett Dam on the Sacramento River, approximately 245 miles of canals and the relocation of 33 miles of railroad which will involve three major bridges.

The first contract on the Friant Dam will probably require 900 tons of the dam's total steel estimate of 4800 tons. The bridge to be constructed over the Sacramento River near Redding will involve approximately 5000 tons of structural steel. Although it is believed that work will be started on all features of the program the money available is sufficient to cover only preliminary construction.

In Southern California school construction is accounting for a goodly number of minor tonnages. Bethlehem Steel Corpn. took 700 tons of shapes for an addition for the Douglas Aircraft Co. at Santa Monica, Cal. The same company was also low bidder on 1000 tons of shapes for a State livestock building at San Mateo, Cal.

Mill operations are reported at full capacity and fulfillment of sheet, tin plate and wire orders is behind schedule. It is believed that a new record may be set during March on the number of ingots poured. Industrial demand has been responsible for the upswing in mill operations.

The scrap market continues stable with a price of $11.00 for heavy melting at the mill. Japanese exports are lighter, due principally to the increase in water freight rates that have resulted from general improvement in exporting. Warehousemen are receiving a satisfactory volume of increased business.

Pipe Lines

Consumers Power Co., Jackson, Mich., plans extensions in welded steel pipe lines for natural gas transmission in Hinton-Millbrook-Belvidere, Mich., gas field district, including steel pipe lines for gathering system. Company has recently acquired Petroleum Transportation Co., operating in area noted, and will consolidate with organization in natural gas division.

Salem, Ore., plans about 18 miles of 36-in. steel pipe for main trunk line water system from new source of supply on North Santiam River, near Stayton, Ore., to city limits, to cost $879,000; also quantity of 18-in. for connecting mains, cost about $200,000; and 10 to 27-in. for primary distribution lines, cost about $125,000. Bond issue of $1,150,000 is being arranged for this, reservoir construction and other work, supplementing available funds. Stevens & Koon, Spalding Building, Portland, are consulting engineers.

Bureau of Reclamation, Denver, asks bids until March 26 for miscellaneous fabricated steel pipe and fittings for Boulder power plant (Specifications 768-D).

Public Utilities Commission, City Hall, San Francisco, plans new steel pipe line from Crystal Springs dam to Burlingame, to be known as Crystal Springs Pipe Line No. 2, for main water system, cost over $500,000; also new pipe line from Sunset reservoir, to cost about $250,000. N. A. Eckart, 425 Mason Street, is engineer.

Birmingham plans immediate call for bids for 60-in. steel pipe for main trunk line for new industrial water system; cost over $1,000,000. WPA, Fifth District, Montgomery, Ala., is active in project, financing being arranged through Federal aid. Bids for other steel pipe will be asked later. Entire development will cost about $6,000,000. Sanborn & Bogert, 30 Church Street, New York, are consulting engineers.

Hidalgo Gas Co., operated by Showers & Moncrief, Inc., Houston, Tex., and associates, plans new welded steel pipe line to Mission, San Juan, Tex., and vicinity to furnish natural gas from gas field district in that area, with distributing lines in these and other communities, including McAllen and Weslaco, Tex., where franchises have been asked. Cost over $350,000. Frank McCarthy is general manager in charge.

L. H. Meyers, Dodge City, Kan., is at head of project to build new welded steel pipe line for natural gas supply from gas field district near Hugoton, Kan., to points in northwestern part of State and in part of Nebraska, about 375 miles, using 10-in. for greater part of route. Cost about $500,000.

Cast Iron Pipe

Dresden, N. Y., plans pipe lines for water system; also 30,000-gal. steel standpipe and other waterworks installation. W. T. Field, Watertown, N. Y., is consulting engineer.

State College, Pa., plans new pipe lines for extensions in water system. Borough Council is completing arrangements for acquisition of local plant and property of State College Water Co. and will make improvements in pumping station, including equipment installation.

Mansfield, Mass., plans pipe lines for extensions and replacements in present water system. Cost about $50,000. Financing will be arranged through Federal aid.

Terryville Water Co., Terryville, Conn., plans pipe lines for water system in number of streets at Plymouth, Conn., includ-

ing new pumping station and other waterworks installation. Cost about $50,000.

Park Falls, Wis., closes bids April 9 for 8550 ft. of 8-in.

Rewey, Wis., closes bids March 20 for furnishing 6600 lin. ft. of 6-in. water pipe.

Houghton and Hancock, Mich., will ask bids soon on joint waterworks improvement costing $165,000, requiring about 30,000 lin. ft. of cast iron pipe.

Orange Grove, Tex., closes bids March 26 for about 17,050 ft. of 2 to 8-in. and 6700 ft. of 1-in. for water system, including trunk main and distributing lines; also for 50,000-gal. elevated steel tank on 100-ft. steel tower, pumping machinery and other waterworks equipment. H. R. F. Helland, Frost National Bank Building, San Antonio, Tex., is consulting engineer.

Culbertson, Neb., will take bids soon for 4-in. pipe for water system. Group Engineering Co., Merchants National Bank Building, Omaha, Neb., is consulting engineer.

Ephraim, Utah, plans pipe lines for improvements in water system. Fund of $27,000 is being arranged through bond issue and Federal aid for this and other municipal improvements.

Sioux Falls, S. D., plans pipe line in part of Lewis Avenue for water system. R. E. Bragstad is city engineer.

Liberty, Mo., will soon take bids for 10 or 12-in. from pumping station at South Liberty to point in city, about 21,000 ft. in all, for main water system. Cost about $80,000. W. E. Barnes, City Hall, is city engineer.

San Francisco has placed 540 tons of 10 to 20-in. with United States Pipe & Foundry Co.

Multnomah, Ore., has awarded 130 tons of 8 and 12-in. to Central Foundry Co.

Treasury Department at Los Angeles has placed 131 tons with an unnamed bidder.

Kent, Wash., asks bids soon for about 900 ft. of 8-in., fittings, etc., and for 108 ft. of 4-in., extra heavy, for water system. John A. Fallgreen, City Hall, Auburn, Wash., is engineer.

Queenston, Ont., plans early purchase of about 10,500 ft. of 6-in. for water system. R. B. Erwin, 449 Queen Street, Niagara Falls, Ont., is consulting engineer.

Tool Company Adds To Plant

KOEBEL DIAMOND TOOL CO., Detroit, manufacturer of diamond wheel-dressing tools, has completed installation of machinery in an additional plant building adjacent to the original building at 1200 Oakman Boulevard. The original plant space will be devoted to executive offices and the manufacture of special diamond boring tools. The new building will house the experimental department and production of Koebel "multi-point," "multi-set" and "multi-edge" tools. The new plant has been equipped with new machinery throughout. The change involves a considerable addition in personnel.

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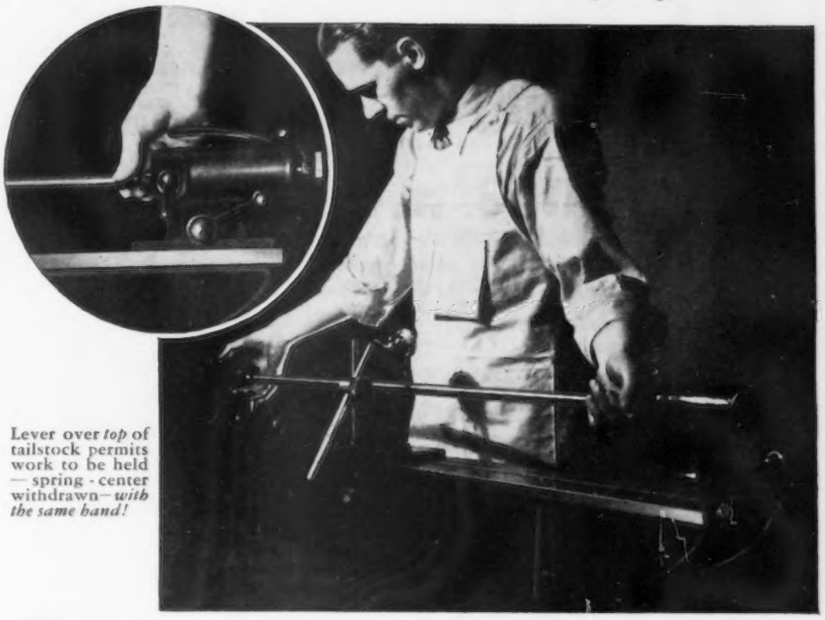
IN BENCH CENTERS.. *in 50 years!"*



Lever over *top* of tailstock permits work to be held — spring-center withdrawn—*with the same hand!*

So said, voluntarily, the close-mouthed chief inspector of one of the largest plants in the country.

All his life he had felt the need of an extra hand in doing centering jobs. Then he saw this improvement, saw how work can be held —spring-center withdrawn—with one hand! He considered the greater convenience, the lessened danger of dropping work, briefly spoke his mind on the matter.

Too, there are several other new features in addition to one-hand centering. Machine tool construction, built to stay put. Quick-leveling studs instead of shims. T-slot in face of bed that keeps head and tailstock aligned; makes practical the mounting of a regulation dividing head,or other inspection fixture, in line with tailstock.

Standard unit is 36″ between centers, 8″ swing. Larger sizes on special order. Full details for the asking. Write today.

THE TAFT-PEIRCE MFG. CO.

WOONSOCKET, RHODE ISLAND

Detroit Gray Iron Pours "Lektrokast"

(CONCLUDED FROM PAGE 76D)

tons are held in ladles until sufficient metal is available to pour a complete die. In each of the new bays which serve the electric furnace there is a 25-ton Whiting crane on a high track which permits the ladle to clear the top of the electrodes on the furnace. In the two other bays are two 10-ton Whiting cranes.

The Detroit Gray Iron Foundry Co. has been marketing its castings under the trade name of "Hi-Test." The new electrically melted iron will be marketed under the name of "Lektrokast." Increase in size of dies for large automotive stampings and specifications for higher qualities in the castings led the company to make this installation, which is the only one of its kind in the Detroit territory.

AMERICAN SPEED-SET METAL Numbering Machines

Note simplicity of operation. It will number large heavy machinery as well as small parts.

Write for new catalog of special machines for all kinds of metal numbering.

American Numbering Machine Co.
224 Shepherd Avenue Brooklyn, N. Y.
Branch: 105 W. Madison Street, Chicago, Ill.

Cleaning of Closed-End Bottle-Neck Parts

(CONCLUDED FROM PAGE 37)

ing to meet varied requirements of internal washing. The conveyor carries the work pieces, each in its magazine, with stop and go, but steadily progressive feed, through a 6-ft. wash section. At each stop position the open end of each piece is directly over a pressure nozzle. From these nozzles is emitted hot, free rinsing alkali solution, under 45 lb. pressure at 50 gal. per min. A like external application of washing solution is simultaneously applied to the bulb exterior. During the go period of the conveyor feed, the pressure solution is "shot" against an overhead sousing guard within the chamber. Thus is created an incessant boiling flood of solution within the wash chamber. The overhead sousing guard is shown, removed, in the foreground, Fig. 5. The solution is used over and over.

Upon leaving the hot-wash chamber, the conveyor carries the bulbs around the take-up end of the machine and into a cold-water rinse chamber which is supplied with water from a factory or city line. Here the rinse is accomplished in the previous manner except that the used water is drained directly to the shop sewer.

Drying is effected, within its chamber, through a system of gas jets directed against the passing bulbs. In this operation, any water remaining within the bulbs is quickly expelled by internally generated steam. Proper vents, to be connected with ducts, are provided for carrying off all steam.

After leaving the drying chamber, heat dried but without change in hardness, the bulbs automatically discharge, each from its magazine, as may be seen at "A," Fig. 3, into a chute from which the cleaned parts may be directed as best suits the requirements in shop routing of particular parts in process.

Existing Facilities Adapted to Prefabricated Construction

(CONCLUDED FROM PAGE 55)

comes in sheets 48¾ in. long by 31 in. wide. The lath is built up of V-stiffened steel ribs 4 in. apart, electrically welded to cross-wires at right angles woven through waterproof paper, with or without metal backing. It is applied so that the ribs on the side walls run horizontally by nailing through the rib at every cross-member. When metallated fabric is used, the bright metal faces the air space. When other types of Metallation are used, they are installed separately in the wall construction. Metallation is simply metal insulation, one form of which consists of sheet aluminum cemented to both sides of a very heavy, tough Kraft paper. It is said to reflect about 95 per cent of the radiated heat that strikes its exposed surface and to allow only about 5 per cent as much heat into or out of a room as ordinary insulation at the same temperature.

The outside wall finish depends upon the desires of architect or owner. If brick veneer is used, Ecod lath is applied directly to the frame, and the veneer is laid up 1 in. from the Ecod fabric and slushed in solidly with mortar. If a stucco finish is desired, no sheathing is applied. If wood siding or shingles are used, sheathing is nailed directly to the metal studs the shingles or siding are applied in the usual manner.

The air-conditioning system is different from all other systems, according to the company, in that it is complete from burner to grilles, including ducts, and supply and return lines.

The Reynolds organization has plants in Sparrows Point, Md., Milwaukee, Wis., Kearny, N. J., and Louisville, Ky.

Many Builders Using Reynolds System

Among the building companies who have contracted to erect houses exclusively on Reynolds specifications in 1936 are: John A. Baldwin, 405 Cedar Lane, Teaneck, N. J.; Bergen Manor, Bergenfield, N. J.; Garden State Housing Co., Teaneck, N. J.; Glen Acres, Ridgewood, N. J.; House of the Month, Ridgewood, N. J.; Brookdale Homes, 202 W. Passaic Avenue, Bloomfield, N. J.; Kings Estate, Inc., Teaneck Road, Teaneck, N. J.; Fanwood Building Co., 102 Central Avenue, Westfield, N. J.; Leonard J. Zehnbauer, 998 Stuyvesant Avenue, Union, N. J.; Mott Brothers, Surrey Road, Hempstead, N. Y.; Mayfair Acres, Greenburg, White Plains, N. Y.; Shaw & Francis, 1021 Locust Street, St. Louis; Canterbury Realty Corpn., Rockville Centre, N. Y.

World Consumption of Copper Rises In February, While Stocks Decline

Lead Market Operations in First Quarter Likely to Exceed Fourth Quarter by 10 Per Cent—Tin Sales More Constant—Zinc Quiet, But Firm

NEW YORK, March 17. — February production of refined copper in the United States totalled 54,512 tons, a decline of 2255 tons from January. Expectations were that there would be an increase. Foreign production rose 2427 tons to 77,044 tons, and world output accordingly showed little change at 131,556 tons. Domestic apparent consumption of 51,416 tons was 1247 tons short of the January figure. On the other hand apparent foreign consumption increased 12,627 tons to 86,744 tons in January. Refined stocks at the end of the month in this country were 232,331 tons, or 534 tons less than a month earlier. Foreign stocks declined 6070 tons to a total of 250,997 tons. Though favorable in themselves, the figures made practically no impression upon the market. Political events abroad are restraining normal activities there, while domestic conditions likewise are more quiet. Sales over the week-end were 1304 tons, increasing the month's total to 14,492 tons. Yesterday 1186 tons was booked. The price is unchanged at 9.25c. a lb., Connecticut Valley, although two large interests continue to quote 9.50c. In London Electrolytic is quoted today at 9.05c. to 9.10c. a lb., European base ports.

Lead

Sustained demand for this metal was reflected in the volume of sales last week, which were heavier than during the preceding favorable period. Commitments by paint interests were said to be exceptionally large, although battery and miscellaneous uses claimed a good proportion of the week's total book. The recent advance in the market's price structure has served only to promote more extensive forward buying by consumers generally. As a result, certain producers are now pretty well booked up through April. Reliable estimates indicate that business in the first quarter will have shown a possible 10 per cent increase over the fourth quarter. The price for lead in the domestic market is unchanged at 4.60c. a lb., with St. Joseph Lead Co. obtaining the usual $1 a ton premium on Eastern contracts.

Zinc

Sales of Prime Western in the domestic market last week totalled 1539 tons, indicating little or no change in volume from the preceding period. Shipments were 4295 tons, and forward sales on company books accordingly decreased 2756 tons to a total of 50,059 tons at the week's close. In the Tri-State area production of ore for the week rose slightly to 10,400 tons, but quotations remain at $31 and $32 a ton, depending on the grade. Unless refined zinc prices advance above the present market basis of 4.90c. a lb., ore quotations are not likely to change.

Prime Western Zinc Producers Committee reports membership sales in February for delivery within the month of 4419 tons of Prime Western at a weighted average selling price of 4.856c. a lb. Forward sales totaled 28,707 tons at a price of 4.851c.

Tin

Buyer interest was more sustained last week than has been the case for quite some time in the tin market. This does not mean that sales bulked necessarily large, but that day-to-day inquiry resulted in importers and dealers remaining moderately active all week. Purchasers were indiscriminate as to positions, as neither immediate, nearby nor more distant requirements outweighed one another in importance. Corresponding to a more uniform rate of sales, prices remained quite steady, the net loss in spot Straits metal at New York having mounted to 0.05c. a lb. since a week ago today. The price, therefore, stands at 48.25c. today at New York, compared with 48.30c. on March 10. In London this morning standard spot was quotable at £215 10s., while futures were £205 15s. The Eastern or Singapore price was £211 15s.

The Week's Prices. Cents Per Pound for Early Delivery

	Mar. 11	Mar. 12	Mar. 13	Mar. 14	Mar. 16	Mar. 17
Electrolytic copper, Conn.*	9.25	9.25	9.25	9.25	9.25	9.25
Lake copper, N. Y.	9.37½	9.37½	9.37½	9.37½	9.37½	9.37½
Straits tin, Spot, New York	48.00	48.35	48.20	....	48.37½	48.25
Zinc, East St. Louis	4.90	4.90	4.90	4.90	4.90	4.90
Zinc, New York†	5.27½	5.27½	5.27½	5.27½	5.27½	5.27½
Lead, St. Louis	4.45	4.45	4.45	4.45	4.45	4.45
Lead, New York	4.60	4.60	4.60	4.60	4.60	4.60

*Delivered Connecticut Valley; price ¼c. lower delivered in New York.
†Includes emergency freight charge.

Aluminum, virgin 99 per cent plus, 19.00c.-22.00c. a lb., delivered.
Aluminum, No. 12 remelt, No. 2 standard, in carloads, 17.00c. lb., delivered.
Nickel, electrolytic, 35c. to 36c. a lb. base refinery, in lots of 2 tons or more.
Antimony, Asiatic, 13.50c. a lb., New York.
Quicksilver, $77.50 to $80.00 per flask.
Brass ingots, commercial 85-5-5-5, 9.50c. a lb., delivered; in Middle West ¼c. a lb. is added on orders for less than 40,000 lb.

From New York Warehouse

Delivered Prices, Base per Lb.

Tin, Straits pig	49.25c. to 50.25c.
Tin, bar	51.25c. to 52.25c.
Copper, Lake	10.25c. to 11.25c.
Copper, electrolytic	10.25c. to 11.25c.
Copper, castings	10.00c. to 11.00c.
*Copper sheets, hot-rolled	16.50c.
*High brass sheets	14.62½c.
*Seamless brass tubes	16.87½c.
*Seamless copper tubes	17.00c.
*Brass rods	13.12½c.
Zinc, slabs	5.75c. to 6.75c.
Zinc, sheets (No. 9), casks, 1200 lb. and over	10.25c.
Lead, American pig	5.10c. to 6.10c.
Lead, bar	6.10c. to 7.10c.
Lead, sheets, cut	8.25c.
Antimony, Asiatic	14.00c. to 15.00c.
Alum., virgin, 99 per cent, plus	23.30c.
Alum., No. 1 for remelting, 98 to 99 per cent	18.50c. to 20.00c.
Solder, ½ and ½	29.50c. to 30.50c.
Babbitt metal, commercial grades	25.00c. to 60.00c.

*These prices are also for delivery from Chicago and Cleveland warehouses.

From Cleveland Warehouse

Delivered Prices per Lb.

Tin, Straits pig	52.37½c.
Tin, bar	54.37½c.
Copper, Lake	10.25c. to 10.50c.
Copper, electrolytic	10.25c. to 10.50c.
Copper, castings	10.00c. to 10.25c.
Zinc, slabs	6.50c. to 6.75c.
Lead, American pig	5.20c. to 6.50c.
Lead, bar	8.50c.
Antimony, Asiatic	16.50c.
Babbitt metal, medium grade	19.00c.
Babbitt metal, high grade	56.37½c.
Solder, ½ and ½	27.50c.

Old Metals, Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators, and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	7.25c.	8.00c.
Copper, hvy. and wire	7.12½c.	7.62½c.
Copper, light and bottoms	6.12½c.	6.62½c.
Brass, heavy	4.00c.	4.62½c.
Brass, light	3.25c.	4.00c.
Hvy. machine composition	6.00c.	6.50c.
No. 1 yel. brass turnings	5.12½c.	5.62½c.
No. 1 red brass or compos. turnings	5.62½c.	6.12½c.
Lead, heavy	3.50c.	3.87½c.
Zinc	2.50c.	2.87½c.
Cast aluminum	12.12½c.	13.25c.
Sheet aluminum	13.25c.	14.75c.

OBITUARY

EDWIN E. ELLIS, vice-president in charge of raw materials of the United States Steel Corpn., died at his home in Short Hills, N. J., on March 10, aged 53 years. Mr. Ellis, who was a nephew of the late Judge Elbert H. Gary, was graduated from Northwestern University in 1904. After engaging in post-graduate work in mining geology at the University of Wisconsin, he spent several years on the Wisconsin and United States Geological Surveys. He joined the Oliver Iron Mining Co., a Steel Corporation subsidiary, in 1906 as asssistant geologist and two years later was transferred as geologist to the Tennessee Coal, Iron & Railroad Co., later becoming assistant manager and manager of that company's land department. In 1925, Mr. Ellis joined the staff of the Steel Corporation in charge of special mineralogical research with relation to non-ferrous minerals. At the same time he was elected president of the Universal Exploration Co., a subsidiary specializing in the mining of non-ferrous minerals. He was elected in 1932 to the position he held at the time of his death. He was a member of a number of technical societies, including the American Institute of Mining and Metallurgical Engineers and the Mining and Metallurgical Society of America.

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STEPHEN H. PINKHAM, vice-president of Remington Rand, Inc., died on March 12.

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NELSON A. GLADDING, vice-president and sales manager of E. C. Atkins & Co., saw manufacturers, died March 8 in Portland, Ore. Mr. Gladding, who was 72 years old, lived in Indianapolis, Ind., where the main factory of the company is located. He became identified with the company in 1885 as a salesman and shortly thereafter was appointed branch manager at Memphis, Tenn., where he remained 12 years. In 1898 he was promoted to secretary and sales manager of the company. He was elected vice-president in 1901.

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JAMES F. LOUCKS, vice-president and chief engineer, Universal Metal Section Co., Cleveland, died March 14, aged 59 years. He was a designer of insulated steel roof decks for industrial and commercial buildings. He severed his connection with the former Brown Hoisting Machinery Co., Cleveland, with which he was connected for 22 years, to form the Holorib Co., which later was merged with the Detroit Steel Products Co. He fonded the Universal company to manufacture universal steel decks and other special sections for building construction.

EDWIN E. ELLIS

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ARTHUR E. ROBINSON, founder and president of the Regal Gasoline Marine Engine Co., Coldwater, Michigan, died March 6.

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J. STUART BROWN, prominent industrialist, died at his home in Sewickley Heights on March 12, aged 85 years. He had been president of Brown & Co., Pittsburgh iron works, for 35 years, liquidating the company when it was 99 years old.

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JOSEPH P. MCNALLY, for the past several years sales engineer for Iron & Steel Products, Inc., Chicago, dealer in railway equipment, died at his home in that city on Feb. 29, aged 68 years.

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CLYDE A. HAEFNER, vice-president of the Detroit Harvester Co., died on Feb. 25.

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WILLIAM J. GILMORE, vice-president of the Ohio Steel Foundry Co., Lima, Ohio, died of a heart attack on March 1, aged 54 years. He started his career in the foundry business as a molder and, after working in various iron and steel foundries in Pennsylvania, he went to the Chicago district to become superintendent of the Indiana Harbor plant of American Steel Foundries. Later he became vice-president of the Hubbard Steel Foundry Co., East Chicago, and was also for a time with the Allied Steel Casting Co. In 1922 Mr. Gilmore became associated with the Ohio Steel Foundry Co. as works manager of the Lima plant and was made vice-president in 1926.

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WILLIAM HENRY REEBY, president until his retirement in 1921 of Reeby Foundry Co., Chicago, died March 1 at his home in Oak Park, Ill. Previous to the organization of the foundry company, Mr. Reeby was president of the W. J. Reeby Elevator Co., which was merged with the Otis Elevator Co. a number of years ago.

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JOHN M. NASH, pioneer Milwaukee manufacturer and designer of woodworking machinery, died at Orlando, Fla., on Feb. 29, aged 93 years. He was born in Eagle, N. Y., in 1843, and after serving through the Civil War, manufactured furniture in Hudson, Wis., until 1880, when he founded the J. M. Nash Co., Milwaukee, of which he became president. He was active head of the business until his death.

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E. H. FROHMAN, vice-president, S. Obermayer Co., Pittsburgh, died recently on the steamer Franconia while on a world cruise. Mr. Frohman was prominent in the work of the Pittsburgh Foundrymen's Association, and was well known in the foundry industry throughout the country.

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W. J. HITCHCOCK, prominent industrialist and son of one of the pioneers in the Youngstown iron and steel business, died in the Presbyterian Hospital, New York, on March 3, aged 72 years. He began his business career with the Andrews & Hitchcock Iron Co., of which his father, also W. J. Hitchcock, was president. He became operating manager of the company which was sold to the Youngstown Sheet & Tube Co. in 1916.

State Bureau of Purchases, State Capitol, Madison, Wis., is asking bids until March 16, 11 A. M., for furnishing State Prison at Waupun, Wis., with approximately 350 tons of material for fabricating automobile license plates, consisting of 39,000 sheets, 32 x 123 in., 26 gage. Original bids opened Feb. 29 were rejected because of wide variation in quotations as to basis, and new bids are asked on first quarter delivery only.

Wheeling Steel Had Best Year Since 1929

WHEELING STEEL CORPN. and subsidiaries had a net profit in 1935 of $3,497,626, the largest for any year since 1929. The net profit in the preceding year was $529,202. After preferred dividend payments and certain other obligations, a sum of $1,854,538 remained for transfer to surplus, which, as of Dec. 31, 1935, totaled $9,602,573. Gross sales in 1935 were $66,262,939. After costs, depreciation, depletion, etc., gross profit from operations amounted to $4,772,286. Addition of other income and deductions for other charges, including Federal taxes, resulted in a net profit before dividends of $3,497,626.

The 1935 gross sales compare with $48,924,844 in 1934 and $44,874,935 in 1933. Production of major commodities of the corporation showed increases in all cases. Steel ingot production alone rose to 1,245,287 gross tons from 876,822 tons in 1934. Employment and earnings also showed gains. The total payroll increased to $25,994,950 from $19,759,347 a year earlier. There were no major construction expenditures made during the year, but certain plant improvements and authorizations called for an outlay of approximately $4,000,000. In addition, toward the close of the year the corporation began its refinancing procedure on a broad scale.

National Steel Nets $11,136,452 in 1935

NATIONAL STEEL CORPN., in the year ended Dec. 31, 1935, had net earnings of $11,136,452 after depreciation, depletion, interest, Federal taxes and other charges. These earnings were equivalent to $5.16 a share on 2,156,977 shares of capital stock and compare with $6,050,722 earned in 1934, or $2.80 a share on 2,155,777 shares. Net sales in 1935 totaled $103,176,629. Net expenditures for additions to plants aggregated $13,182,844 as against but $1,747,319 expended in 1934.

According to the corporation's report, the 96-in. continuous hot and cold strip mill at Detroit will be completed about April 1, and modernization and enlargements of other units are proceeding satisfactorily.

Ernest T. Weir, chairman, stated in the annual report that "the improvement in earnings over the previous year is the result of the appreciably better rate of operations experienced by the steel industry in the last fiscal year." The 1935 earnings were the highest since the formation of the corporation in 1929.

Otis Earnings Up Sharply in 1935

OTIS STEEL CO., Cleveland, earned $2,228,664 in 1935. This was the best showing since 1929 and is equivalent to $1.69 per share on common stock. The 1935 net profit is, after deduction of Federal taxes, estimated at $395,000 and depreciation of $865,316, and compares with a net profit of $560,891 in 1934. Marked improvement in the company's financial position is shown by an increase in working capital, which amounts to $4,505,520. During the year the company reduced its bank obligations by $1,175,000, leaving a balance of $1,300,000 at the close of the year.

Westinghouse Profits Increased in 1935

WESTINGHOUSE ELECTRIC & MFG. CO., East Pittsburgh, Pa., had net income of $11,983,380 for 1935, compared with $189,562 in 1934. Of this 1935 net income $1,606,625 was a non-recurring item representing dividends received and profits realized from securities of Radio Corpn. of America sold in compliance with Federal Court decree of 1932. Sales billed totaled $122,588,555 compared with $92,158,893 in 1934, an increase of 33 per cent. Orders received amounted to $123,629,333, compared with $106,473,226 in 1934, an increase of 16 per cent.

Financial Notes

American Zinc, Lead & Smelting Co., Boston, reports 1935 net loss of $219,150, compared with 1934 net profit of $113,420.

Anaconda Wire & Cable Co., New York, reports 1935 net income of $1,029,401, equivalent to $2.32 a share on $442,470 capital shares. Net income for 1934 was $821,802, or $1.95 a share.

Art Metal Construction Co., Jamestown, N. Y., had 1935 net profit of $259,147, equal to 91c. a share on 284,222 shares of $10 par common stock. In 1934 net loss was $71,970.

Bridgeport Brass Co., Bridgeport, Conn., reports 1935 net profit at $726,617, or $1.12 a capital share, compared with 1934 net profit of $576,636, or $1.11 a share.

Bridgeport Machine Co. had 1935 net income of $139,871, or 70c. a common share, against 1934 net income of $221,907, or $1.24 a share.

Continental Steel Corpn., Kokomo, Ind., and subsidiaries, reports for six months ended Dec. 31, 1935, net profit of $336,832, compared with loss of $240,922 over same period a year earlier.

Eastern Rolling Mill Co., Baltimore, reports for 1935 net loss of $134,267, compared with 1934 net loss of $347,153.

Emsco Derrick & Equipment Co., Los Angeles, Cal., had 1935 net profit of $571,306, or $1.53 a share on 373,594 common shares, against $444,164, or $1.19 a share, in 1934.

Granite City Steel Co., Granite City, Ill., reports 1935 net income at $618,358, or $2.43 a capital share. In 1934 net profit was $258,761, or $1.01 a share.

International Harvester Co., Chicago, reports for 1935 net profit of $19,618,238, equivalent, after dividend requirements on the preferred stock, to $6.19 a share on 2,245,773 no-par common shares. Net income in 1934 was $3,948,636, or $4.83 a share on the preferred stock.

National Radiator Corpn., Johnstown, Pa., had 1935 net loss of $375,715.

Sharon Steel Corpn., Sharon, Pa., reports for 1935 net profit of $1,009,153, equal to $2.74 a share on 368,359 no-par shares of capital stock. This compares with net loss of $36,528 in 1934.

United Engineering & Foundry Co., Pittsburgh, reports net profit for 1935 of $1,631,156 after all charges and taxes, equivalent to $1.92 per common share. This compares with net earnings of $718,395 or 81c. per share in 1934, based on the present capitalization. During the year the common stock was split two for one.

Pittsburgh Forgings Co., Pittsburgh, had net profit in 1935 of $57,864 after expenses, interest, depreciation and Federal and State taxes, equal to 27c. a share on capital stock outstanding. This compares with a net profit of $31,040 in 1934 or 14c. a share on capital stock outstanding. Net loss of Greenville Steel Car Co., a subsidiary, not consolidated, was $69,920 for 1935, compared with a profit of $164,330 in 1934.

Pittsburgh Screw & Bolt Corpn. sustained a net loss of $46,004 in 1935, compared with a net profit of $228,696 in 1934.

Cleveland Cliffs Iron Co. earned $2,440,547 in 1935 after deducting $924,345 for depletion, depreciation and Federal taxes. This compares with earnings of $775,489 in 1934. Included in the 1935 earnings were dividends of the Lake Superior and Ishpeming Railroad Co. amounting to $1,353,870 of which approximately $700,000 represented dividends paid from earnings accumulated in previous years. The company's financial position was materially improved and interest charges were reduced by funding operations adopted during the year. The company shipped 2,751,378 tons of Lake Superior ore during the year, an increase of 40 per cent over 1934.

United States Pipe & Foundry Co., Burlington, N. J., reports for 1935 net profit of $1,169,071, compared with 1934 net profit of $818,068.

January Steel Exports and Imports Decline

EXPORTS of semi-finished and finished iron and steel products from the United States during January aggregated 82,602 gross tons and represented a decline of 8.9 per cent from the December total, but an increase of 7.8 per cent when compared with shipments made during the corresponding month of 1935.

Scrap exports (iron and steel, tin plate, and waste-waste tin plate) amounted to 158,962 tons and registered 7 per cent higher than the total shipped in the previous month, but 14.6 per cent less than the January, 1935, trade.

Iron and steel imports at 50,489 tons were 5.9 per cent lower in January than in the previous month. This total was, however, 123 per cent larger than that for the corresponding month of 1935.

Returns for the January export trade reveal that when compared with those in December the outstanding decreased shipments were recorded in heavy rails (3144 tons), skelp (2478 tons), "other plate" (2367 tons), car wheels, tires and axles (1858 tons), galvanized steel sheets (1486 tons), and barbed wire (1692 tons). The most prominent increase was that in black steel sheets (1145 tons), closely followed by galvanized wire (1113 tons), and welded black steel pipe (1022 tons). Other increases of moment were those which occurred in wire rods (996 tons), cold rolled stripped steel (972 tons), and plain wire (740 tons). Comparing all individual iron and steel classifications, decreases occurred in 34, gains in 28, while in one item (welded boiler tubes) the trade remained constant in both months.

Tin plate was the outstanding iron and steel product within the semi-finished and finished group shipped from the United States during January from a tonnage standpoint. Numerous outlets were found in the distribution of the 18,025 tons shipped chiefly to China, Japan, Argentina, Brazil, and Uruguay.

Sources of American Imports of Iron and Manganese Ores

(In Gross Tons)

	January			
	Iron Ore		Manganese Concentrates, 35 Per Cent or Over	
	1936	1935	1936	1935
Canada	....	....	....	....
Cuba	33,500	22,000	....	3,180
Chile	86,600	43,600	....	160
Spain	....	....	....	....
Norway	7,131	7,092	....	....
Sweden	....	....	....	....
French Africa	....	....	....	....
Russia	7,750	8,150	25,990	6,564
India	....	....	....	186
Brazil	6,100	....	14,603	....
West Africa	....	....	11,451	6,038
Other countries	*12,578	5,564	3,548	....
Total	153,659	86,406	55,592	16,128

*From Australia.

United States Imports of Pig Iron by Countries of Origin

(In Gross Tons)

	January	
	1936	1935
United Kingdom	932	50
British India	3,631	....
Germany	1,608	....
Netherlands	4,511	....
Canada	....	929
France	....	....
Belgium	529	....
Norway	102	....
Sweden	....	200
Russia	3,720	....
All others	....	854
Total	15,033	2,033

Imports of Iron and Steel Products into the United States

(In Gross Tons)

	January	
	1936	1935
Pig iron	15,033	2,033
Sponge iron	308	257
Ferromanganese [1]	2,248	2,630
Spiegeleisen [1]	2,040	....
Ferrochrome [2]	....	....
Ferrosilicon [3]	96	124
Other ferroalloys [4]	....	1
Scrap	7,714	2,415
Pig iron, ferroalloys and scrap	*27,439*	*7,460*
Steel ingots, blooms, etc.	....	99
Billets, whether solid or hollow [5]	68	....
Wire rods	1,974	775
Semi-finished steel	*2,042*	*874*
Concrete reinforcement bars	131	109
Hollow steel bars	205	50
Merchant steel bars	3,055	2,210
Iron slabs	....	....
Iron bars	147	58
Boiler and other plate	50	10
Sheets, skelp, and saw plate	2,096	321
Die blocks or blanks, etc. [4]	4	....
Tin plate	4	4
Structural shapes	4,679	3,569
Sheet piling	507	....
Rails and track material	262	211
Welded pipe	362	21
Other pipe	2,096	1,669
Hoops and bands for baling	....	80
Other hoops and bands	1,899	2,207
Barbed wire	2,237	1,684
Round iron and steel wire	447	415
Telegraph and telephone wire	....	....
Flat wire and strip steel	232	112
Wire rope and strand	185	193
Other wire	109	146
Nails, tacks, and staples	2,177	993
Bolts, nuts and rivets	18	36
Horse and mule shoes	14	82
Rolled and finished steel	*20,916*	*14,180*
Malleable iron pipe fittings	4	37
Cast iron pipe and fittings	....	....
Castings and forgings	88	144
Total	50,489	22,695

[1] Manganese content.
[2] Chrome content.
[3] Silicon content.
[4] Alloy content.
[5] New class. No comparable figures for previous years.

Exports of Iron and Steel from the United States

(In Gross Tons)

	January	
	1936	1935
Pig iron	186	261
Ferromanganese and spiegeleisen	7	3
*Other ferroalloys	274	....
Iron and steel scrap	153,906	179,630
Tin plate scrap	2,461	4,209
Waste-waste tin plate	2,595	2,273
Pig iron, ferroalloys and scrap	*159,429*	*186,376*
Ingots, blooms, billets, sheet bars	95	3,221
Skelp	812	373
Wire rods	3,939	3,279
Semi-finished steel	*4,846*	*6,873*
**Bars, concrete reinforcement	250	....
†Bars, other steel	3,153	4,899
Iron bars	118	233
Plates, iron and steel	3,534	2,019
Sheets, galvanized steel	6,295	5,324
Sheets, galvanized iron	130	99
Sheets, black steel	8,816	12,166
Sheets, black iron	616	401
Hoops, bands, strip steel	4,954	2,772
Tin plate and taggers' tin	18,025	14,954
Terne plate (including long ternes)	433	282
Structural shapes, plain material	3,348	1,663
Structural material, fabricated	1,162	1,711
‡Sheet piling	285	....
Tanks, steel	2,080	774
Steel rails	4,330	1,000
Rail fastenings, switches, spikes, etc.	892	715
Boiler tubes	459	832
Casing and oil line pipe	2,484	4,058
Pipe, black and galvanized, welded steel	3,290	4,195
Pipe, black and galvanized, welded iron	387	144
Plain wire	5,030	3,220
Barbed wire and woven wire fencing	1,744	2,724
Wire cloth and screening	74	100
Wire rope	409	231
Wire nails	675	783
Other nails and tacks	242	349
Other wire and manufactures	365	365
Bolts, nuts, rivets and washers, except track	461	438
Other finished steel	213	72
Rolled and finished steel	*74,254*	*66,523*
Cast iron pipe and fittings	785	818
Malleable iron screwed fittings	227	269
Carwheels and axles	285	489
Iron castings	846	849
Steel castings	210	116
Forgings	682	427
Castings and forgings	*3,035*	*2,968*
Total	241,564	262,740

*New class. No comparable figures for previous periods.
**New class. Previously included under steel bars.
†New class. Includes alloy, non-alloy, and stainless steel bars, excepting concrete reinforcement bars.
‡New class. Previously included with structural material, fabricated.

Unusual Features in New Three-High Sheet Mill for Australia

THE Mackintosh-Hemphill Co., Pittsburgh, has just received an order from John Lysaght, Ltd., Newcastle, New South Wales, Australia, for a 52-in. three-high automatic sheet mill.

The new mill includes several features which will make it differ from any mill previously constructed. In three-high breakdown sheet mills, for rolling sheet and tin bars, it is important to have a quick-acting controlled screwdown to make possible a large number of pairs per turn and to maintain accurate gage. Mackintosh-Hemphill engineers have made an extensive study of the screwdown mechanism, and as a result the new mill will have a screwdown with an extremely low WR^2; in other words, an unusually small inertia in the moving parts, thus permitting extremely accurate setting of the rolls by the pre-set control. It is believed that no other mills have been built before with such low inertia in the screwdown mechanism and consequently such fine accuracy of gage setting.

The top rolls are balanced by means of springs, and the middle roll is balanced by means of air cylinders. A balanced mill, of course, necessitates a pinion stand, which permits heavy drafts on both bottom and top passes and thereby cuts down the total number of passes and increases the tonnage. On the new mill, both the top and the bottom rolls are power driven.

The pinion stand proper is a totally inclosed type, with provisions for forced feed lubrication for the pinion teeth and pinion bearings. All pinions are designed with double helical cut teeth, having a solid apex and solid shrouds. Pinions with solid shrouds have a considerable advantage over pinions with loose shrouds and are considerably stronger. The middle roll necks are equipped with roller bearings mounted in steel casting chucks which hold the middle roll positively in alinement.

The top and bottom rolls are provided with side adjustment so that the rolls may be set off-center in either direction, if desired. The top and bottom roll necks are equipped with fabric chucks. For lining the top roll there is an adjustable breaker, which permits lining up the roll from the floor level and which, due to its location in the mill, does not rotate with the screwdown and, therefore, does not add to the inertia in the screwdown mechanism. The top roll bearings are loosely connected to the housing screws in such a fashion that the top roll may be raised by the screwdown motors when changing the middle roll. The total roll-changing time for the middle roll, from the time the top roll is raised to the time when it is lowered with a new roll in place, is six minutes.

The middle roll may be changed while the top and bottom rolls are running, thereby eliminating the necessity of shutting down the whole train of mills, in event that the three-high unit is connected to existing two-high or three-high stands on the same drive.

The cross-section of the housing posts is unusually large, minimizing housing stretch and insuring accurate gage of rolled product.

The pre-set control is mechanically connected to the screwdown shaft. The pre-set control indicators are mounted directly on the side of the housing in front of the operator.

The mill is expected to deliver approximately 60 tons per eight-hour turn, based on a time cycle of 14 seconds, or 2000 pairs in an eight-hour shift.

Booklet Discusses Townsend Plan

THE Townsend plan, how its advocates expect it to work, and how it actually would work if put into effect, is described in a 42-page booklet entitled "The Townsend Scheme," published by the National Industrial Conference Board, Inc., 247 Park Avenue, New York. It proposes to collect from 20 to 25 billion dollars annually in taxes from the whole population and transfer this amount to eight of nine million persons over 60 years of age, who would be required only to spend it promptly for consumption and cease saving and working for the rest of their lives.

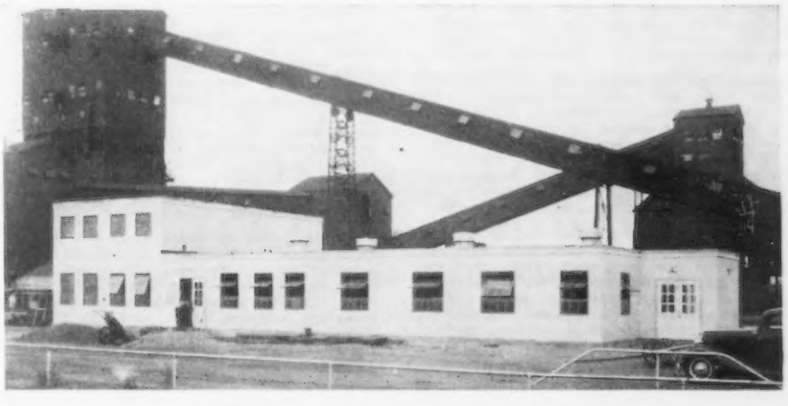
Pre-Fabricated Steel Industrial Unit

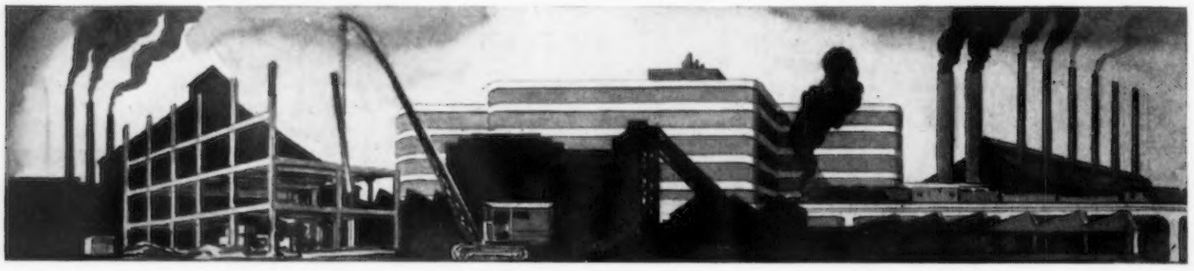
PRE-FABRICATED frameless steel buildings of one and two stories, heretofore confined to residential structures, have made their entrance into the industrial field. More than a year ago the Insulated Steel Construction Co., Middletown, Ohio, erected a combination office and storage building at the plant of the Hamilton Coke & Iron Co., Hamilton, Ohio.

The building, part of which is two stories high, is 40 by 90 ft. All walls and partitions are formed of Armco steel. In addition to office accommodations, it has locker and shower facilities for workers, and a modern, up-to-date hospital room for first-aid treatment.

Officials of the Hamilton company have awarded a contract to the Insulated Steel Construction Co., for erection of another building, this one 41 by 32 ft. It will be used exclusively for the storage of oil.

As in the construction of frameless steel houses, a granular type of insulation is poured between the inner and outer steel walls. It effectively retains the heat in winter and resists the summer heat.





Plant Expansion and Equipment Buying

Motor Makers Lead in Current Machine Tool Demand

THE loosening of consumer demand for automobiles, due to the thawing out of a hard winter, may be responsible for the increased activity in machine tool demand and inquiry experienced during the past week. Tool and die shops catering to the motor makers are also feeling the upward impetus.

An optimistic occurrence in the Cincinnati district, where prevailing demand has been chiefly for small and medium types of machines, was the purchase of four planers by four separate users.

The index of orders of the National Machine Tool Builders' Association for February was 112.1. This is slightly higher than for January of this year and was only exceeded twice since 1931.

NORTH ATLANTIC

Continental Oil Co., 60 East Forty-second Street, New York, has let contract to Doullut & Erwin, Inc., Queen and Crescent Building, New Orleans, for new bulk oil storage and distributing terminal at Lake Charles, La., including oil-loading wharf and operating facilities. Cost about $100,000 with equipment. F. Shutts & Sons, Ryan Street, Lake Charles, are engineers.

W. N. Best Engineering Co., Inc., 75 West Street, New York, manufacturer of oil burners and oil-burning equipment, has leased one-story factory at 2208 Parkway, Delawanna, N. J., for new plant.

Superintendent of Lighthouses, St. George, Staten Island, New York, asks bids until March 30 for 300 marine motor flasher mechanisms and 300 automatic electric light changers (Proposal 50748).

Board of Education, 500 Park Avenue, New York, will soon begin superstructure for new three-story industrial high school in Bronx, for which excavation contract has been let to National Excavation Corpn., 295 Madison Avenue. Cost over $1,000,000. William C. Martin, Flatbush Avenue Extension and Concord Street, Brooklyn, is architect and superintendent of schools.

American Gas & Electric Co., 30 Church Street, New York, is arranging fund of $15,000,000 for expansion and improvements in electrical properties in different parts of country, including power plants and installation of additional equipment, with new hydroelectric generating station on Kanawha River, near Winfield, W. Va., for Kanawha Valley Power Co., Charleston, W. Va., a unit of organization, to cost about $3,000,000 of sum noted; also extensions in transmission and distributing lines for various utilities.

Signal Supply Officer, Army Base, Brooklyn, asks bids until March 27 for nuts with internal threading and external knurling, 200 control shafts, 34,000 ft. flexible shafting, 4300 flanged sleeves, 3000 terminals for steel cable, 34,000 ft. flexible casings, 4000 coupling nuts (knurled), 400 tuning shafts, 4000 internally splined sleeves (Circular 152), 1550 mast sections (Circular 150); until March 30, mountings for radio receivers (Circular 156).

Galsworthy, Inc., 730 Frelinghuysen Avenue, Newark, N. J., wines and liquors, has leased about 15,000 sq. ft. in building on Jelliff Avenue, for new storage and distributing plant.

Commanding Officer, Ordnance Department, Frankford Arsenal, Philadelphia, asks bids until March 23 for one turret punch throat (Circular 378), four or six annealing room pickling baskets (Circular 376), radial ball bearings (Circular 374); until March 25, one hose blast machine and one blast helmet (Circular 381); until March 26, five air filters for air compressors (Circular 382); until March 27, one universal milling machine (Circular 363), one form turning lathe (Circular 364).

Crescent Ink & Color Co., 460 North Fifth Street, Philadelphia, manufacturer of printing inks, industrial colors, etc., has let general contract to Rafferty-Kennedy Co., 1313 West Luzerne Street, for one and two-story addition. Cost close to $50,000 with equipment.

Quartermaster Depot, Twenty-first and Johnston Streets, Philadelphia, asks bids until March 24 for one edge folding machine including dies (Circular 200).

Board of Education, Scranton, Pa., plans manual training equipment in new three-story junior high school at South Scranton, for which general contract has been let to Breig Brothers, Scranton. Cost about $350,000.

Walter Price, who recently resigned as president, treasurer and general manager of Philadelphia Range, Boiler & Tank Co., Philadelphia, has organized Tidewater Boiler Works, Inc., to manufacture galvanized range boilers and kindred products. Company is located at Pier 13, Port Richmond Terminals, Philadelphia.

SOUTH ATLANTIC

Glascock Stove & Mfg. Co., 1614 West Lee Street, Greensboro, N. C., has let general contract to F. D. Lewis & Son, Greensboro, for one-story addition, 116 x 170 ft. Cost over $40,000 with equipment. Company plans installation of new enameling furnace and other equipment.

Commanding Officer, Ordnance Department, Augusta Arsenal, Augusta, Ga., asks bids until March 26 for expansion anchors, bolts, bits, switch boxes, switches, hangers and other supplies (Circular 8).

Southern Waxed Paper Co., 840 Woodrow Avenue, S. W., Atlanta, Ga., has asked bids on general contract for one-story addition, 50 x 200 ft. Cost over $65,000 with equipment.

Quartermaster, Fort Barrancas, Fla., asks bids until March 24 for special copper anchors and set special tools (Circular 28).

NEW ENGLAND

Commanding Officer, Ordnance Department, Springfield Armory, Springfield, Mass., asks bids until March 23 for twist drills, straight-shank drills, files, cutters, cotter pins, 2000 lb. steel wire nails, 600 bench vises, 500 soldering coppers, four high-speed steel cutters, 600 gasoline torches and other equipment (Circular 159); until March 26, one set of progressive steel dies for blanking, forming and drawing in one operation ferrule front-hand guard (Circular 155), one automatic Brinell testing machine (Circular 160); until March 25, one motor-driven inclinable punch press, one straight-side motor-driven double crank press, and one gap frame open back press with motor drive (Circular 142), one internal grinding machine (Circular 149); until April 3, one direct-connected synchronous motor-driven air compressor (Circular 177).

Bryant Electric Co., Railroad Avenue, Bridgeport, Conn., manufacturer of electric switches, sockets, plugs, etc., has asked bids on general contract for one-story addition, 90 x 220 ft. Cost close to $100,000

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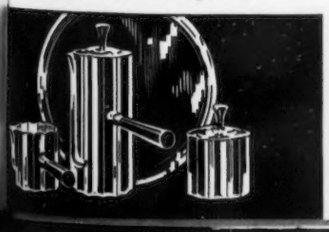
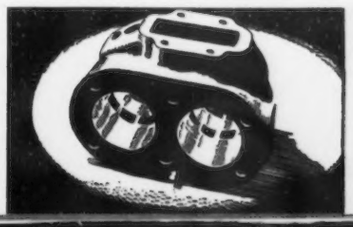
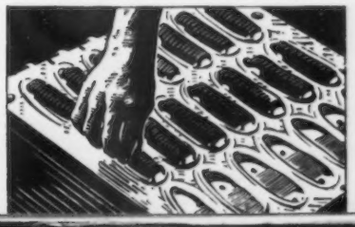


Machinery parts are protected against wear and corrosion



Life of molds, dies, tools greatly increased by chromium plating



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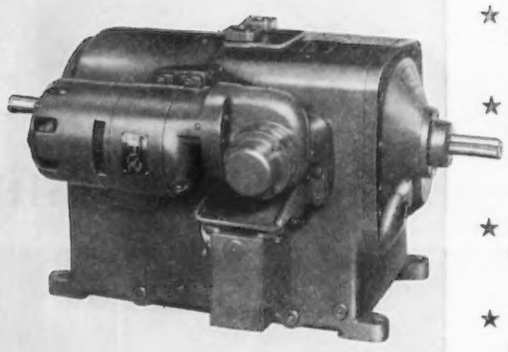

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with equipment. Fletcher-Thompson, Inc., 1336 Fairfield Avenue, is architect and engineer.

Board of Education, Providence, R. I., plans manual training department in new three-story and basement high school on Hope Street, for which bids will be asked soon on general contract. Cost about $1,500,000. Financing has been arranged through Federal aid. I. S. Gorman, City Hall, is city architect in charge.

Warren Telechron Co., Ashland, Mass., manufacturer of electric clocks and clock mechanisms, parts, etc., has acquired former local plant of General Chemical & Solvents, comprising about two acres and building of about 10,000 sq. ft. floor space, and will remodel for expansion, particularly in punch press and coil-winding divisions, which will be removed to new location. Company is a unit of General Electric Co., Schenectady, N. Y.

◀ WESTERN PA. DIST. ▶

Pittsburgh Coal Co., Oliver Building, Pittsburgh, plans early development of coal deposits in Fallowfield Township, near Charleroi, Pa., recently acquired, and adjoining coal acreage extending from Catsburg district, to include mining and operating machinery, conveying, elevating, loading and other equipment. Entire project will cost over $300,000.

Municipal Sanitary Board, Bluefield, W. Va., asks bids until March 25 for pumping machinery and other equipment for new municipal sewage treatment plants, including two 2100-gal. per min. and one 1400-gal. per min. pumping units with accessories, one 100-gal. per min. and one 50-gal. per min. motor-driven centrifugal sludge pumps with auxiliaries, control equipment, switchboard; also for priming tanks, filters, chlorinating equipment, etc. Morris Knowles, Inc., Westinghouse Building, Pittsburgh, is consulting engineer.

B. Preiser Co., Washington Street West, Charleston, W. Va., industrial chemicals, has plans for new two-story plant, 40 x 180 ft., primarily for storage and distribution. Cost about $30,000 with equipment. Warne-Tucker-Silling, Inc., Masonic Temple Building, is architect.

◀ BUFFALO DISTRICT ▶

American Radiator Co., 1803 Elmwood Avenue, Buffalo, has filed plans for several one-story additions, including foundry unit, new crane shed, loading dock, and storage and distributing unit.

Houde Engineering Corpn., 537 East Delavan Avenue, Buffalo, manufacturer of automobile shock absorbers and kindred specialties, has acquired plant and business of Kelch Heater Co., 6525 Russell Street, Detroit, manufacturer of hot-air heaters for automobiles, parts, etc., and will transfer manufacturing unit to Buffalo plant, where production will be carried out.

Niagara-Hudson System, Electric Building, Buffalo, affiliated with Buffalo General Electric Co., same address, plans about 2000 miles of new transmission and distributing lines, including power substation and service facilities for rural electrification. Cost over $500,000.

◀ SOUTH CENTRAL ▶

Stitzel-Weller Distilling Co., Story Avenue, Louisville, has let general contract to Coombs Lumber Co., 439 East Main Street, Lexington, Ky., for seven-story storage and distributing building, 65 x 135 ft., near Schivley, Ky. Cost close to $90,000 with equipment.

Director of Purchases, Tennessee Valley Authority, Knoxville, Tenn., asks bids until March 23 for electrical conductor cable and accessories for department of electricity; until April 2, single circuit steel transmission towers for about 67 miles of line between Wheeler Dam, Ala., and Guntersville Dam, Ala.

Common Council, Scottsville, Ky., plans new municipal electric power plant. Fund of $150,000 is being arranged through Federal aid. R. O. Huntsman, mayor, is active in project.

United States Engineer Office, Vicksburg, Miss., asks bids until April 3 for two cast steel suction heads (Circular 203), two portable motor-driven electric welding machines (Circular 205).

Old Joe Distilling Co., Lawrenceburg, Ky., plans multi-story addition for storage and distribution. Cost close to $100,000 with equipment. Company has recently begun expansion program at distillery and will install additional equipment.

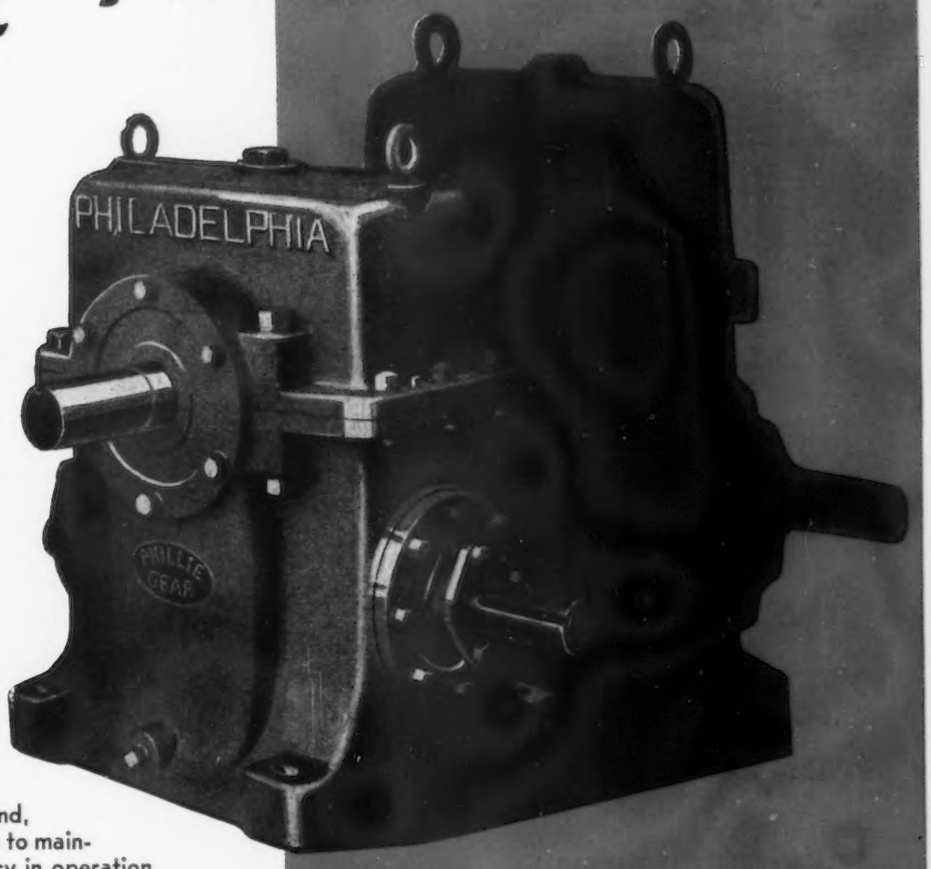
◀ SOUTHWEST ▶

Cupples-Hesse Envelope & Lithographing Co., 4173 North Kingshighway, St. Louis, has let general contract to Gamble Construction Co., 620 Chestnut Street, for two-story addition to paper-converting plant, 120 x 170 ft., and improvements in present factory. Cost over $125,000 with equipment. Austin Co., Arcade Building, is architect and engineer.

Bailor Mfg. Co., Atchison, Kan., manufacturer of agricultural equipment, plans new division of business, and will establish local plant for manufacture of ethyl alcohol, using grains as source of raw material. Plant will operate under special process. Cost $200,000 with processing and other machinery. Financing has been arranged.

Board of Public Works, Little Rock, Ark., asks bids until March 30 for pumping machinery and auxiliary equipment for new municipal sewage works, for which bids will be received at same time; also for

Here's Real Economical Power Transmission



Efficient, economical power transmission is dependent upon the merit of the design of the transmission device . . . the precision with which it is built . . . and, upon the ability of the device to maintain its "brand-new" efficiency in operation throughout the wear-and-tear of a long service life.

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manholes and other equipment. Hugh R. Carter, National Standard Building, and Frank A. Pritchett, Wallace Building, both Little Rock, are engineers. W. W. Horner, 722 Chestnut Street, St. Louis, is consulting engineer.

Red Bluff Power Control District, care of J. H. Miller, Pecos, Tex., secretary, asks bids until April 2 for one 1600-hp. and one 1200-hp. hydraulic turbines, with governor system and accessories; steel penstock; vertical electric generators, 1625 and 1250 kva., direct-connected to exciters; switching equipment, transformers, switchboard, miscellaneous equipment; one 10-ton manually-operated single I-beam geared crane, with trolley and hoist, all for hydroelectric power plant at Red Bluff Dam, near Orla, Tex. Vernon L. Sullivan, Orla, is district engineer.

Common Council, Marfa, Tex., asks bids until March 28 for new municipal Butane air-gas plant and distributing system. Fund of $63,000 has been arranged. P. McDonald Biddison, Petroleum Tower Building, Dallas, Tex., is consulting engineer.

Bureau of Reclamation, Austin, Tex., asks bids until March 31 for construction of Arnold Dam and power plant, including crane and crane rails, gate hoists, about 415,000 lb. gates, control mechanism, power penstock, metal trash rack, cast iron pipe, fittings, valves, etc. Part of materials will be furnished by Government (Specifications 673).

MICHIGAN DISTRICT

E. O. Bulman Mfg. Co., Inc., Grand Rapids, Mich., manufacturer of store and display fixtures, parts, etc., has let general contract to Owen-Ames-Kimball Co., Grand Rapids, for two-story addition. Cost about $45,000 including equipment.

Michigan Brewing Co., Inc., Grand Rapids, Mich., Glendon A. Richards, president, has approved plans for installation of new equipment to increase capacity. Storage and distributing facilities also will be enlarged. Certain equipment will be furnished by Central Boiler Works, 5791 Russell Street, Detroit. Entire project will cost over $50,000.

Ale Co. of Northville, Northville, Mich., care of Smith, Hinchman & Grylls, Marquette Building, Detroit, architects and engineers, recently organized, has taken over former plant of Stinson Aircraft Corpn. and will remodel for brewery. Work will begin early in spring. Cost close to $50,000 with equipment. Engineers noted are in charge.

Old Dutch Refining Co., Muskegon, Mich., is considering extensions in oil refinery, with equipment for gasoline production. Cost close to $200,000. Company has recently increased capital by $450,000, part of fund to be used for expansion noted.

OHIO AND INDIANA

Carpenter Metal Products Co., 13001 Taft Avenue, Cleveland, manufacturer of small metal specialties, aluminum goods, etc., has acquired building in immediate vicinity of present works, totaling about 15,000 sq. ft. floor space, or about twice existing plant area, and will remodel for new plant and remove to new location.

City Council, Ashland, Ohio, has plans for new municipal electric power plant and distributing system and will begin work soon. Cost over $1,000,000. Barstow & Lefeber, Akron, Ohio, are consulting engineers.

Standard Register Co., 107 Campbell Street, Dayton, Ohio, manufacturer of continuous printing and manifolding equipment, plans one-story addition. Cost over $40,000 with equipment.

Louise Coal Co., Bergholz, Ohio, plans rebuilding tipple and conveyor house at local coal-mining properties, recently destroyed by fire. Loss about $50,000 with equipment.

City Council, Wapakoneta, Ohio, has plans for new municipal steam-electric power plant. Cost over $150,000 with equipment. Burns & McDonnell Engineering Co., 107 West Linwood Boulevard, Kansas City, Mo., is consulting engineer.

Contracting Officer, Material Division, Air Corps, Wright Field, Dayton, Ohio, asks bids until March 25 for six rivet heading tools, 24 threaded mandrels, six keyway cutting tools, 18,000 hollow threaded rivets for use with heading tool (Circular 654), seven accelerometers (Circular 666); until March 26, 17 precision lathes, 17 engine lathes, motor-driven (Circular 618), steel ball bearings and bearing assemblies (Circular 616); until March 27, 14 motor-driven milling machines (Circular 623), one tank vibrating machine (Circular 673), six wind indicator assemblies and three wind indicator envelope assemblies (Circular 615); until March 30, 5200 low voltage capacitors (Circular 655), 2-in. and 1⅛-in. self-locking padlocks (Circular 628); until March 31, 324 hole saw arbors and 17 high-speed hole saws (Circular 644).

Truck Engineering Co., 3130 East Pontiac Street, Fort Wayne, Ind., manufacturer of motor truck bodies, hoists, etc., has let general contract to William D. Swank, 2025 Lynn Street, for one-story addition, 40 x 140 ft. Cost close to $50,000 with equipment.

WASHINGTON DIST.

Purchasing and Contracting Officer, Holabird Quartermaster Depot, Baltimore, asks bids until March 31 for 1-ton level type jacks, lubricating guns, combination slip joint pliers and engineers' wrenches (Circular 120).

Owens-Illinois Can Co., Boston and Linwood Avenues, Baltimore, operating at former plant of Tin Decorating Co., recently acquired, has let general contract to Lee Paschall Co., 122 North Eighth Street, Richmond, Va., for extensions and improvements. Cost about $35,000. Francisco & Jocobus, 511 Fifth Avenue, New York, are architects and engineers. Company is a subsidiary of Owens-Illinois Glass Co., Toledo, Ohio.

General Purchasing Officer, Panama Canal, Washington, asks bids until March 23 for twist drills, pipe dies, pressure-reducing valves, compression cocks, bibb cocks, magnet wire, 4000 ft. copper-jacketed steel tubing, ratchet braces, three railway switch stands and other equipment (Schedule 3130); until March 30, assorted files, cast iron water pipe fittings, split dies, screw clamps, etc. (Schedule 3131).

Jewell Ridge Coal Corpn., Jewell Ridge, Va., will soon take bids for new steel coal tipple, including head house and other structures, with six loading tracks, equipped with shaker screens, classifying screens, picking tables and other equipment, including main belt conveyor system from mine to tipple. Cost over $75,000 with machinery. Allen & Garcia Co., 332 South Michigan Avenue, Chicago, are consulting engineers.

Bureau of Yards and Docks, Navy Department, Washington, asks bids until April 15 for two 75-kw. Diesel engine-generator sets with accessories, for aviation property at St. Thomas, Virgin Islands (Specification 8168).

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until March 24 for faucets, cocks and valves (Circular 7381), steel flanges (Schedule 7384); until March 27, cast iron pipe fittings (Schedule 7412), radio shielding assemblies for aircraft engines (Schedule 900-9361) for Eastern and Western yards.

MIDDLE WEST

Chicago Flexible Shaft Co., 5600 West Roosevelt Road, Chicago, has asked bids on general contract for one-story addition, and improvements in present plant. Cost close to $40,000 with equipment. S. N. Crowen & Associates, Inc., 30 North LaSalle Street, is architect.

Signal Corps Procurement District, 1819 West Pershing Road, Chicago, asks bids until March 24 for 10,000 plugs (Circular 45).

Village Council, Henning, Minn., asks bids until March 26 for pumping machinery and accessories, 50,000-gal. wooden tank on 100-ft. steel tower, and miscellaneous equipment for new municipal waterworks. Druar & Milinowski, Globe Building, St. Paul, Minn., are consulting engineers.

United States Engineer Office, Fort Peck, Mont., asks bids until March 23 for six chain drives for dragline service (Circular 417), machine bolts and nuts, washers, lock washers and kindred iron and steel specialties, 110 different items in all (Circular 420).

Illinois Tool Corpn., 2501 North Keeler Avenue, Chicago, manufacturer of reamers, cutters, broaches and other cutting tools, has let general contract to Albert S. Low, 510 North Dearborn Street, for one-story plant unit, 107 x 119 ft. Cost over $75,000 with equipment. T. B. Jorgensen, 510 North Dearborn Street, is architect.

Bunge Elevator Co., Chamber of Commerce Building, Minneapolis, Minn., has plans for new grain elevator, with capacity of 1,250,000 bu. Cost about $400,000 with equipment.

Meeker Co-Operative Light & Power Association, Litchfield, Minn., recently organized, plans about 420 miles of new transmission and distributing lines for rural electrification in parts of Meeker County, with power substation and service facilities. Power will be secured from municipal power station at Litchfield. Fund of $450,000 has been secured through Federal aid. Work will begin in spring.

Armour & Co., Union Stock Yards, Chicago, have plans for addition to branch packing plant at Omaha, Neb., and improvements in present plant. Cost close to $450,000 with equipment.

PACIFIC COAST

Payne Furnace & Supply Co., 338 North Foothill Road, Beverly Hills, Cal., will soon take bids on general contract for one-story top addition to present one-story plant, 78 x 150 ft.; also for two-story administration building, 42 x 72 ft. Cost over $50,000 with equipment. William J. Gage, 468 North Camden Drive, Beverly Hills, is architect.

Bureau of Reclamation, Denver, asks bids until March 27 for following equipment for Grand Coulee Dam, Wash.: Three motor-driven centrifugal pumping units, capacity 500 gal. per min.; four similar units, capacity 750 gal. per min.; three similar units, capacity 1000 gal. per min.; one such unit, capacity 1500-gal. per min.; two similar units for priming service, capacity 30 gal. per min. All equipment will be installed by Government (Specifications 769-D); until March 30, 57 portal assemblies, two bronze liners and anchor rods for 54 gate frames, and 108 liner supports for bulkhead gate frames for turbine draft tubes in East and West main units of power station, same project (Specifications 772-D).

Coca-Cola Bottling Co., Bakersfield, Cal., has let general contract to Henry Eissler, 2229 Eighteenth Street, for two-story bottling plant. Cost about $60,000 with machinery. Charles H. Biggar, Haberferlde Building, is architect.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until March 24 for 66,000 lb. admiralty-metal condenser tubes (Schedule 7388), two automatic stud machines (Schedule 7400) for Puget Sound Navy Yard.

FOREIGN

Austin Motor Co., Ltd., London, England, manufacturer of popular priced automobiles, plans several large one-story plant units for parts production and assembling. Cost close to $2,000,000 with machinery.

City Council, Bloemfontein, South Africa, asks bids until April 6 for steam power plant equipment for municipal station, including two boiler units with stokers, complete mechanical draft plant, dust extraction plant, ash-handling plants, valves, fittings, etc., and steel-frame building.

A. Scrivener, Ltd., Birmingham, England, manufacturer of high-speed multi-tool lathes, grinding machines and other totaling 40,000 sq. ft. floor space. Cost industries, plans new one-story plant, machine tools for automotive and aircraft over $100,000 with equipment.